VOLUME XXXIX | Established 1914 | Number 3

CHEMICAL INDUSTRIES

SEPTEMBER, 1936

CHEMICAL INDUSTRIES is published monthly by Chemical Markets, Inc. WILLIAMS HAYNES, *President*; H. H. ADAMS, *Vice-President*; WILLIAM F. GEORGE, *Secretary-Treasurer*.

Published on the tenth day of each month at New Haven, Conn., and printed for the publishers by The Tuttle, Morehouse & Taylor Company.

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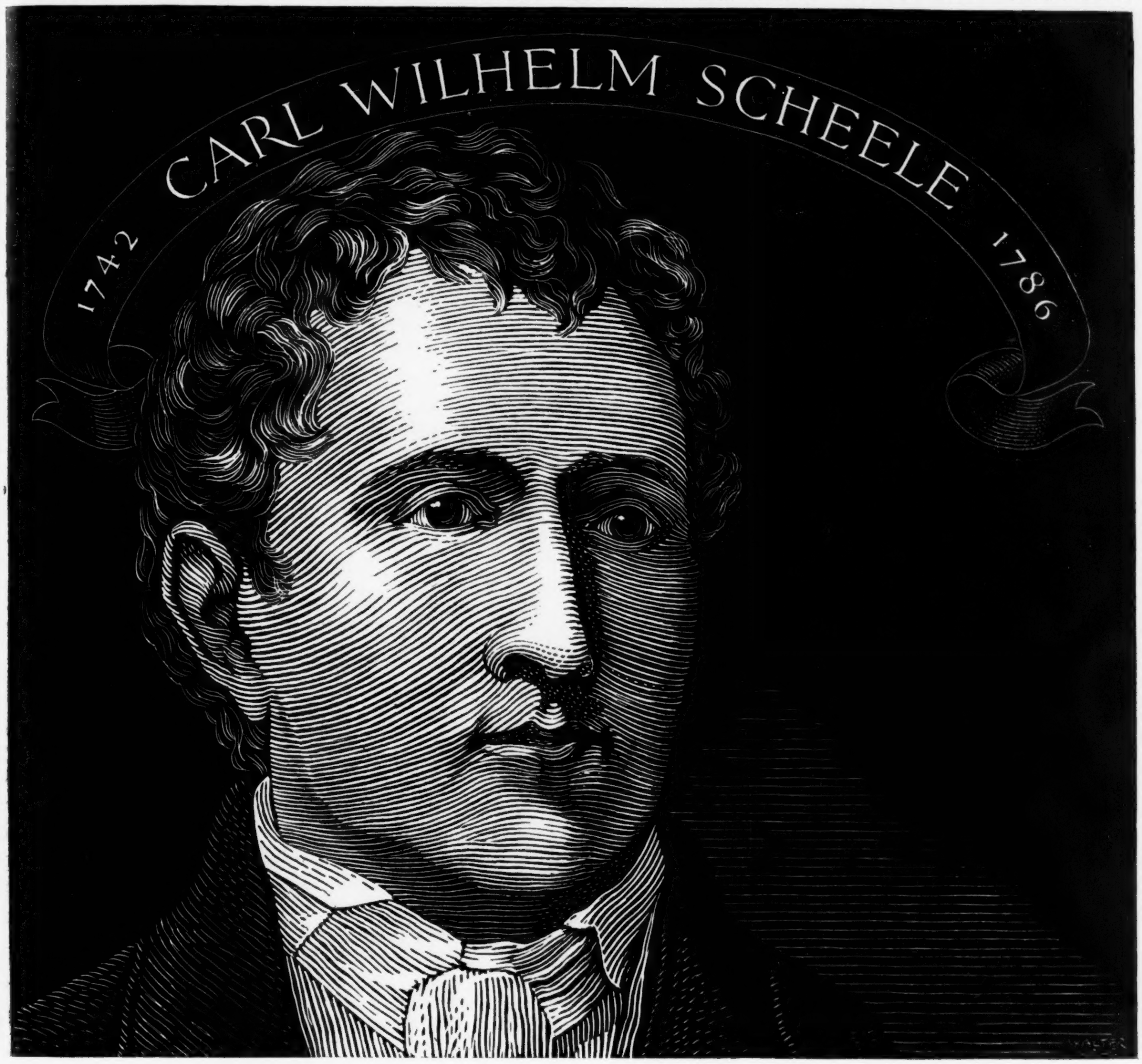
NUMBER SIX OF A SERIES OF FAMOUS PIONEERS IN CHEMICAL HISTORY



IN 1774 Scheele, the Swedish pharmacist, while investigating the properties of manganese dioxide, accidentally produced chlorine. Not recognizing the gas as a new element, Scheele named it "dephlogisticated muriatic acid" in accordance with the "phlogiston" theory of that time. It was some years, however, before Scheele's discovery found commercial application in the form of chloride of lime or bleaching powder, and nearly one hundred and fifty years before the wide usefulness of chlorine was fully realized. Ever since the advent of liquefied chlorine gas, early in the present century, Mathieson has been a pioneer in new developments connected with the production, distribution and efficient application of chlorine and chlorine products.

The MATHIESON ALKALI WORKS (*Inc.*), 60 East 42nd St., New York, N.Y.

One of the unique distinctions gained by Scheele was an election to the Swedish Academy of Science, an honor never accorded, before or since, to a student of pharmacy. The greatest chemical discoverer of his age, Scheele's accomplishments were the more striking in contrast with their background. An obscure apothecary, living a solitary life in a small town on the shore of a Scandinavian lake, he was constantly harassed by poverty and debt and was at times the victim of the most depressing melancholy.

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH AND HTH-15 . . .

Mathieson Chemicals

AMMONIA, ANHYDROUS AND AQUA . . . PH-PLUS (FUSED ALKALI) . . . SOLID CARBON DIOXIDE . . . CCH (INDUSTRIAL HYPOCHLORITE)

The Reader Writes:—

A Layman's Suggestion

I recently got one of your CHEMICAL GUIDE books. It describes excellently the character, appearance, and uses of the different chemical products. It does not, generally, give the *source* of the products. For example, take Phthalic Anhydride, which I understand is derived from coal tar, or caustic soda, which I believe is a by-product of the manufacture of chlorine or vice versa! Perhaps the chemical formulas preceding the descriptions do indicate the basic constituents, but to me who never studied chemistry, they are reminiscent of algebraic formulas and meaningless. My interest in this point arises from a desire to understand as clearly as possible the practical uses of the products of companies in which I venture to advise my clients to invest their money. If the rayon industry is booming, I know somebody is selling a lot of caustic soda, etc. I should have felt hesitant about making any suggestion to you—because of my own general ignorance of chemistry, but I recently asked the district manager of one of our well-known—very well-known indeed—chemical companies, just what the practical uses of caustic soda were and he couldn't readily tell me. He didn't even mention use by the rayon industry, which is right here under our nose.

So, perhaps just an added line or two, which would give to a layman like me the clue to the basic material in the chemical, would be appreciated by other users.

What, for instance is butane gas? It escapes from the refrigerator and puzzles our inquisitive wife. I can't tell her what it is, neither can the service man, and finally—neither does your GUIDE!

Cleveland, Ohio. R. R. ALEXANDER

International in Scope

We wish to thank you for publishing the article on our "Syntex" product in your July issue.

We made one very definite discovery about CHEMICAL INDUSTRIES through the publishing of the article and that is that it is read in many parts of the world. What more can be said about it!

New York City. ROBERT GORDON, Gordon-Lacey Chemical Products Co.

America First

In looking over the article taken from the Farm Chemurgic Council meeting at Detroit I note that you omitted Pyrethrin 1 in the fifth paragraph. This should read .54% to 1.02 Pyrethrin 1. This little difference makes our strains better than anything imported from the Kenya or anywhere else.

Belleville, Pa. R. E. CULBERTSON

Price Discrimination

Your efforts to make the meaning of the Robinson-Patman law clear are appreciated, but not very successful. Even after re-reading carefully the three articles in your August issue I am as confused as ever, and I cannot find anyone who has a sane explanation of what can and what cannot be done legally. You are probably right in thinking the law, for all its impossible provisions, must be taken seriously. It is put up in the most plausible and popular form of protection for the little fellow, but if one looks below the surface some workable form of protection for free competition is a needed offset to the natural, selfish, and strong motives making for a more and more complete monopoly through the centralization of producing capacity on the one hand and buying power on the other. Competition in the chemical industry is more free than in many others, yet there are plain signs of this move towards monopoly and, to misquote the Bible to my own purpose, it is even now about as easy for a small man to break into the manufacture of standard heavy or fine chemicals and coal-tar dyes or aromatics as it is for the camel to get through the eye of the needle.

Bridgeport, Conn. WALTER HENRY HOWE

Growing Importance of Trade Marks

Don't you think that an article, some time, in CHEMICAL INDUSTRIES on the subject of trade marks would be interesting to your readers? The results of a survey as to the trend in trade marking, as well as the history back of some of the outstanding marks of the industry would also prove helpful.

Several issues back you indicated that chemical advertising was a minus zero about 15 years ago. It will be stimulating reading to know what outstanding trade marks have been developed in that period, both names and designs, and to go behind the scenes a little to learn how they were built.

In the above you will sense a need on my part to know what the present trends are in trade marking of chemical products. Any research which you have made on the subject, which you feel at liberty to share, will be greatly appreciated.

Philadelphia, Pa. FRANCES M. SUAREZ, Philadelphia Quartz Company

Wanted—The Love Bug

A friend of mine has told me about a poem; I do not know anything about it other than these few words:

The Microbe will get you if you don't watch out, and I understand it mentions the Love Bug.

Hoping you can send me a copy of this whole poem, or put me on the right road to locate it, as I would like to have it. Thanking you kindly in advance, I remain,

Philadelphia, Pa. JOHN BARRETT

P. W. A. Butts In

It's just too bad if, as I read in the papers, the P. W. A. is going to take up tung oil. We ought to produce our own tung oil. Can't we do it without the political axe grinding that is part of all Government projects or the land-booming tactics that in the old days gave the orange plantations such a black eye? It seems not. For smart people, we Americans surely are big suckers.

New Orleans, La. T. F. O'NEIL

Getting Out of Business

How unjust and prejudiced are some of the charges made against Mr. Roosevelt! Take this matter of putting the Government into business in competition with the taxpayers, which is a favorite campaign cry of our industrial leaders. Hasn't the testing of Pontol, Hydronol, and Agdite for denaturing in S. D. formulas 11, 12, and 13 been taken away from the Washington laboratories of the Bureau of Internal Revenue and given to a small group of "authorized chemists?"

And I would like to know who those "authorized chemists" are, and how they were selected, and by whom.

Baltimore, Md. GEORGE N. ALLISON

CHEMICAL INDUSTRIES

VOLUME XXXIX NUMBER 3

Election Prospects

OUR child-like belief in straw votes, built up by the accuracy of the Literary Digest's forecast of recent presidential elections, is quite apt to be shattered, for the coming election turns upon elements not susceptible to post-card balloting. Never have the influences of corrupt political machines and of the vote for the third candidate been so potent and so hard to measure. Thus the efforts of all our straw vote collectors are chiefly important in convincing many citizens that the Republicans have an excellent chance to win, which effect may be quite offset by stirring the Democrats to more vigorous action.

Mr. Farley must make good the default of "a solid West" upon which he could count six months ago when he said that the election was "in the bag". The West is no longer solid for Roosevelt. The East is more solid against him. Nevertheless, the solid South, the border states of Tennessee, Kentucky, Missouri, and Oklahoma, with California and Wisconsin, Illinois and New York yield 271 electoral votes, a majority of five.

This arithmetic, in these early stages of the campaign, determines Democratic strategy. Kentucky, Tennessee, and Oklahoma are reasonably safe. Unless the Lemke vote is heavy, California and Wisconsin are better than even chances. New York, Missouri, and Illinois are conceded to be doubtful, and in all these states—and in Massachusetts and New Jersey as well—Roosevelt leans heavily upon machines, Tammany in New York City, Kelly in Chicago, and Pendergast in Kansas City.

Polls tell little about machine-made votes. They estimate badly the strength of the third candidate. Both factors become increasingly important as the campaign speeds towards Election Day.

Price Minus Cost Equals— That ancient business formula: price times yield minus cost equals profit, has recently been expounded anew by the four Brookings Institute reports on the producing capacity and consuming ability of the American people. Very simple arithmetic shows that to increase the final figure—which is the object of all business transactions—there are more than a dozen practical combinations of these factors which range from the "plough-under theory" of restricting the yield and raising both cost and price, to the "abundance theory" of lowering the cost by increasing the output and then stimulating the larger demand by lowering the price.

When the editorial writer in the *Journal of Commerce* said that "chemical prices never advance," he forgot the war periods of price history when chemical prices have always soared high above the increase in the general level of prices; but nevertheless he stated what is a fundamental, long-haul truth. The Brookings experts—as professional economists do so commonly—overlooked some very impressive data among the chemical price lists, but we ourselves have failed, as an industry, to capitalize not so much our constantly lower prices; but the vastly more important economic contribution which chemicals are making to better and cheaper consumer goods. The automobile has been held up as the outstanding example of "more for less money." How much of that is due, and will be due, to improved, cheaper chemicals? Rubber accelerators speed up tire production and a few cents worth of anti-oxidant increases the mileage greatly. A new synthetic resin makes a cheaper, more easily applied, more durable "paint job." Out of a host of such examples, reduced to definite dollars and cents terms, might be built a tremendously effective industrial publicity campaign.

Yet to Come The collapse of private credit was fundamentally the cause of the present depression. The collapse of public credit would destroy values, and check activity infinitely more seriously. For the past three years the fiscal policies of the present Administration have pointed straight towards a national bankruptcy, and, at the present rate of expenditure, this could not be postponed longer than a year hence. Not only has the national debt been piled to a new high piling record, largely for relief and pump-priming expenditures; but the running expenses of the regular government departments also have without exception increased tremendously. The Roosevelt regime has added forty-five new Federal bureaus and abolished one—ironically, that one is the Efficiency Bureau.

Immediately this is the most serious problem confronting the nation today. Without a strong and solvent Federal government, it makes very little difference what may be done in Washington about unemployment or social security, price control, tariffs, national defense, or any other item of our domestic or foreign policies.

Very carefully the notion has been fostered that a return of anything like normal business activity would provide ample revenue in the form of present taxes to meet the wholly abnormal spending of the last few years. Very skillfully the impression has been created that, if additional taxes were necessary, they will be paid by the wealthy. However, two taxes, new to the American people, are in immediate prospect. The undivided surplus tax will force the payment of dividends upon which any small security owner will have to pay increased income taxes. The Social Security Act is going to bear down directly upon the workman. The prospect of these taxes is not pleasing, and it emphasizes the waste and extravagance of the relief and public work programs. Whoever is elected in November is bound to find the sentiment of the country swinging strongly towards economy in the Federal government's program and a pretty widespread belief that recovery had best be left to the hands of industry, trade, and agriculture. These influences will be most potent in Congress; but the Executive will not be wholly beyond this pressure.

Profits and Taxes If you want to be properly impressed with the silliness of the new undivided profits tax we commend to your attention the abstract from the latest issue of that invariably interesting "Little Bulletin" reprinted in our Plant Administration and Operation Department. By means of a very simple hypothetical case the cans and can'ts of this tax are set forth and its financial nitwittery made crystal clear. It would indeed seem to be almost perfectly designed to bleed the strong corporation white and to cripple the small company with shackles.

We dislike to gloat over another's misfortunes, and we certainly would not be so brazenly tactless as to have made the suggestion directly ourselves; but we cannot quite resist the temptation to call this article particularly to the attention of company treasurers, sales managers, and directors of advertising. There is a real message in it for each of them. And may we, quite selfishly, remind them, that research is noble, but advertising brings home the bacon.

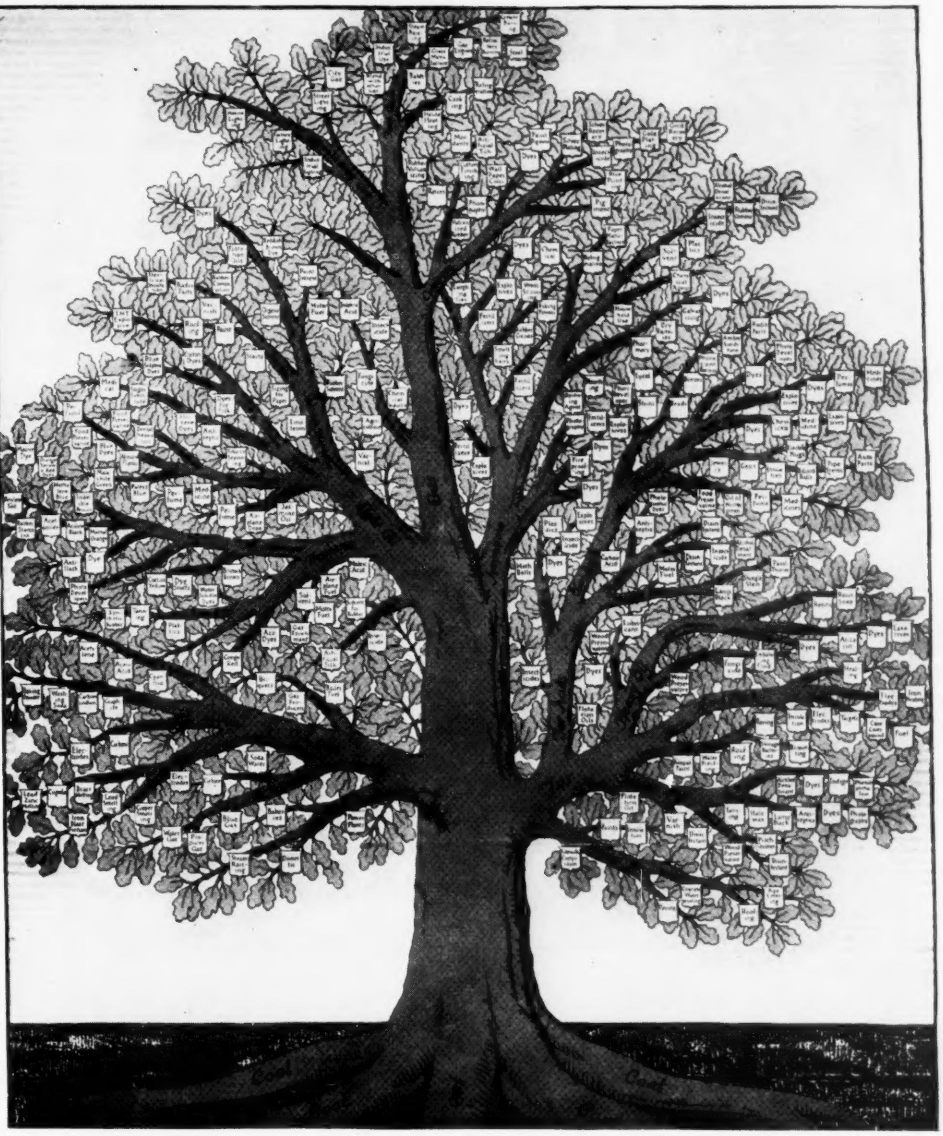
The Chemical Processing of

COAL

By

Gilbert Thiessen

Illinois State Geological Survey



"Coal Products Tree" which appeared on the back of a dividend announcement from Eastern Gas and Fuel Associates. Originally prepared by the Koppers Co.

Dyes and aromatics and high power explosives, those showy and over-publicized products of coal tar, are less basically important to modern chemical industry than more prosaic materials from coke. Rapid changes in the objects and the technique of coal processing for chemical materials, which are extremely important today, are ably reviewed in this fact-packed article.

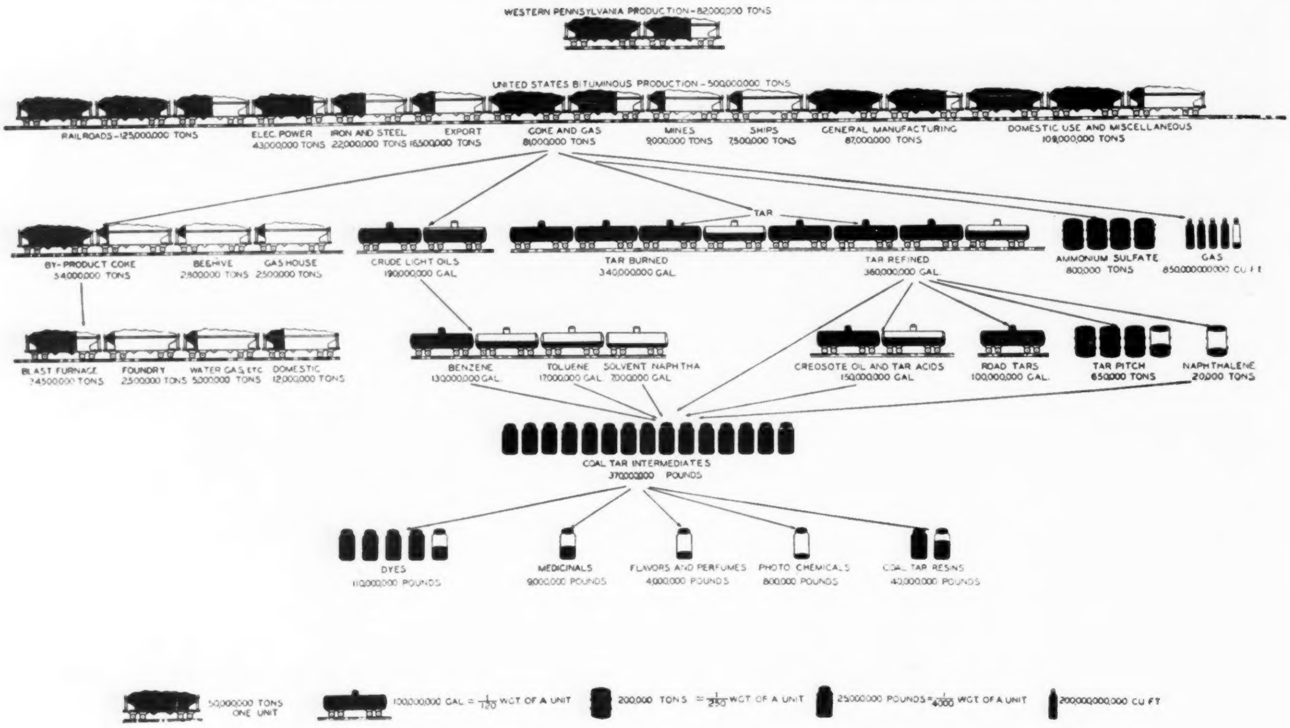
RELATIVELY few raw materials form the foundations of chemical industry—water, coal, salt, sulfur, limestone, and petroleum are of basic importance. The only other raw material of similar importance is air. Water and air are common enough to be frequently overlooked as raw materials and before long petroleum may not be considered as cheap in a class with coal, water and salt. Petroleum substitutes are being made in England and Germany now.

If it were necessary, our demands for sulfur, as well as petroleum, could be met by coal. This sulfur can be obtained (1) in the form of pyrites as a by-product during preparation; (2) as sulfur from the purification of coal carbonization gases; or (3) as sulfur dioxide or sulfuric acid recovered from flue gases. The 33½ million tons of coal burned by public electric utility plants in 1934 would yield a third of a million of tons of sulfur or one million tons of sulfuric acid for each per cent. of sulfur the coal contained. In 1934 the United States' demand for sulfur was about 1.5 millions of tons.

Coal holds a preeminent place in the modern chemical scheme, for coal serves a dual purpose. It furnishes heat and power needed in carrying out the manufacturing processes and at the same time is used as a raw material or source of raw material used in the processes. It is the use of coal in chemical processes that we wish to discuss here.

Coal as such is not used extensively as a raw material in chemical processes. Instead, it finds its use in the form of coke or the by-products obtained during coke making. It is not necessary to call attention to the magnitude and importance of the chemical industries

AVERAGE PRODUCTION AND DISPOSAL OF BITUMINOUS COAL FOR A NORMAL YEAR



Compiled December 1934 by the Coal Research Laboratory, Carnegie Institute of Technology.

built upon coal tar and its derivatives; yet only a small part of our chemical industry based upon coal is based upon coal tar. The largest user of coal products is the iron and steel industry which uses coke for the reduction of iron ore to metallic iron. It may be stretching a point to include the iron industry as a part of chemical industry, but blast furnace reactions are definitely chemical and are controlled by routine chemical analyses. Since the iron industry is not generally thought of when chemical industry is mentioned, it will not be given detailed consideration here. It must not be forgotten, however, that coal tar by-products are obtained during the manufacture of coke, the great bulk of which is used by the iron and steel industry.

Coal enters chemical industry as a chemical raw material (1) as coke, (2) as the so-called coal tar by-products and (3) as coal for use as a reducing agent and for use in the synthesis of liquid fuel by destructive hydrogenation. The chemical uses of coke can broadly be outlined as follows:

Chemical Uses of Coal Coke

I. Metallurgical uses
   A. Ferrous metallurgy—blast furnaces
   B. Non ferrous metallurgy[1]
      Zinc, lead, copper
II. Use in manufacture of carbides
   A. Calcium carbide[2]
      1. Acetylene
         a. DuPrene[3]
         b. Acetic acid[2]
         c. Chlorides of ethane[2]
      2. Cyanides[4] and cyanamid[4]
   B. Carbon disulfide
      Xanthates—viscose and flotation reagents
   C. Hard carbides
      Silicon carbide,[5] boron carbide,[6] tungsten carbide, tantalum carbide,[7] zirconium carbide[7]
   D. Graphite[5]
III. Syntheses starting with carbon monoxide, carbon dioxide, water gas and hydrogen
   A. Methanol[8]
      1. Formaldehyde
      2. Acetic acid[9]
   B. Higher alcohols[10]
      Esters and acids
   C. Ammonia[4]
      1. Urea[11]
      2. Nitric acid[4]
   D. Hydrogenation of unsaturated compounds[8]
      1. Hydrogen from water gas and from carbon monoxide and steam
      2. Coal hydrogenation
   E. Hydrocarbons from $CO + H_2$[8]
      1. Synthin and Kogasin of Fischer and Tropsch[12, 13]
   F. Reactions involving addition of CO or CO_2
      $C_6H_6 + CO \quad C_6H_5CHO$
      Benzene + carbon monoxide yields benzaldehyde
      $C_6H_6 + CO_2 \quad C_6H_5COOH$
      Benzene + carbon dioxide yields benzoic acid
      $C_{10}H + CO_2 \quad C_{10}H_7COOH$
      Naphthalene + carbon dioxide yields naphthoic acid
      $C_6H_5OH + CO_2 \quad C_6H_4OH\,COOH$
      Phenol + carbon dioxide yields salicylic acid

Because of its historical and colorful associations, and because it lends itself to popular exposition, the

"coal tar" industry has received much attention from popular writers. A common way of showing the ramifications and extent of the coal tar industry is by means of the coal tar tree. Unfortunately for one's sense of proportion the actual quantities of coal product represented by the various branches or "boxes" are not shown. Charts have been prepared which show the quantity of the various constituents present in coal tar, but coal tar is not processed to recover all the constituents in it. For the sake of orientation a typical coal tar tree is reproduced.

Chemical Uses of Coal Coke

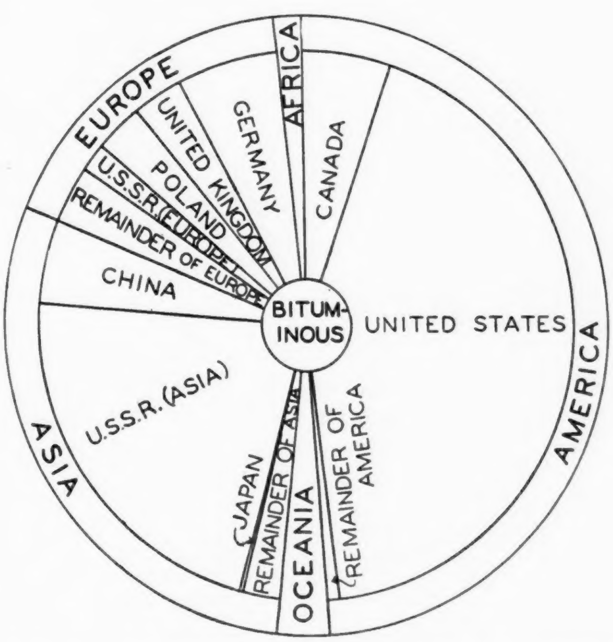
Statistics[14] for 1934 show that the largest single outlet for coke is the iron industry, accounting for 18,410,800 tons or 61.0 per cent. of the total coke used. The quantity of coke used in the strictly chemical industry is relatively small in comparison. The amount of coke stated to have been used in 1934 for industrial use including water gas production amounted to 1,573,483 tons or 5.27 per cent. of the total coke used.

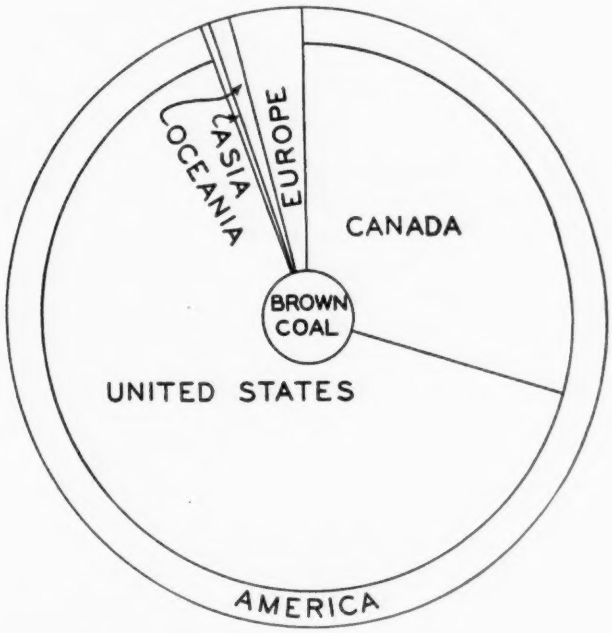
In 1934 the world production of calcium carbide was approximately 3 millions of tons of which one-half was used for the fixation of nitrogen as cyanamid, and 400,000 tons for the manufacture of synthetic organic chemicals by way of acetylene. The United States' production of calcium carbide is estimated to have been 101,500 tons in 1933. Since twelve to fourteen hundred pounds of coke are required for the manufacture of one ton of CaC_2, this corresponds to a world consumption of about 2 millions of tons and a United States consumption of about 65,000 tons of coke for carbide manufacture. Fixation of nitrogen as cyanamid is relatively unimportant at the present time in the United States. The main use for calcium carbide in the United States is for the preparation of acetylene, which is used for welding and illumination and as an intermediate in the synthesis of acetic acid, various chlorine substituted ethane solvents and DuPrene, Du Pont's synthetic rubber-like material.

Carbon bisulfide, an electric-furnace product made by combining elemental carbon, introduced either as charcoal or as coke, with elemental sulfur, is the keystone of the viscose process. Carbon bisulfide, a caustic alkali and an alcohol combine to form a class of compounds known as xanthates to which class belongs viscose which is sodium cellulose xanthate, cellulose in this case being the alcohol. By suitable treatment the cellulose may be regenerated in the form of fine filaments for rayon, in sheets, tubes or other useful forms. Other xanthates are used in large quantities in the flotation concentration of metallic ores such as copper, zinc and gold; 903,487 pounds being thus used in 1933 by the mining industry in the United States.

Graphite, silicon carbide ("Carborundum," "Crystolon"), boron carbide ("Norbide") and tungsten carbide are all products of the electric furnace, the first being exceedingly soft, the last exceedingly hard, softer only than the diamond, another form of carbon.

The trend of the chemical industry is more and more towards the use of simpler compounds as raw materials. The manufacture of methanol, ammonia and nitric acid are good examples of this trend. First obtained through the destruction of highly complex and organized natural compounds they are now more cheaply made by synthesis from oxides of carbon, nitrogen and hydrogen, these in turn coming from coke, air and steam. The reactions involved appear unbelievably simple compared to the tremendous amount of research and development which has been expended to bring them into practical industrial use. The basic reactions involve the production of carbon monoxide, carbon di-





Left, the relative bituminous coal resources of the principal countries of the world. Right, the relative brown coal and lignite resources of the principal countries of the world.

Estimates of World Reserves of Bituminous and Brown Coal by Principal Countries in 1936
Millions of Metric Tons

Continent and countries	Total of probable and assured reserves: Bituminous	Brown	Percentage distribution of total reserves by countries: Bituminous	Brown
North and South America:				
Canada	243,435	860,438	5.32	29.83
United States	1,975,205	1,863,452	43.17	64.59
Others	32,598	4	.71	....
Total Americas	2,251,238	2,723,894	49.20	94.42
Europe:				
Belgium	11,000	....	.24	....
Czechoslovakia	28,410	12,393	.62	.43
France	16,611	1,614	.36	.06
Germany	288,721	56,758	6.31	1.97
Netherlands	4,402	5	.10	....
Poland	138,128	17,326	3.02	.60
United Kingdom	200,161	....	4.37	....
U. S. S. R. (Europe)	74,790	5,940	1.63	.21
Others	17,406	16,866	.38	.58
Total Europe	779,629	110,902	17.04	3.84
Asia:				
China	217,058	568	4.74	.02
Japan*	16,691	778	.36	.03
Manchukuo	4,480	....	.10	....
U. S. S. R. (Asia)	1,007,742	9,774	22.02	.34
Others	98,259	2,602	2.15	.09
Total Asia	1,344,230	13,722	29.38	.48
Total Oceania	134,157	35,298	2.93	1.22
Total Africa	66,577	1,054	1.45	.04
World Total	4,575,831	2,884,870	100.00	100.00

* Includes Formosa, Korea, Sakhalin.

oxide and hydrogen from water gas or the separation of these gases from coke oven gas by liquefaction and distillation.

Methanol is relatively a newcomer in the ranks of synthetic chemicals since it was only eleven years ago that the first shipment of German synthetic methanol reached this country. Today 85 per cent. of the world's supply of methanol is synthetic. A great decrease in price has placed it in many competitive fields and has greatly extended its use. One of its uses is in the manufacture of formaldehyde of which the world consumed 75,000 tons of 40 per cent. formalin in 1934, largely in synthetic plastics. A coming development will be the production of acetic acid from methanol by the catalytic addition under pressure of carbon dioxide. It is not inconceivable that ethyl alcohol can eventually be made competitively by the reduction of acetic acid so synthesized.

Besides methanol higher alcohols can also be synthesized. The methanol synthesis can be so regulated that only methanol is produced or so that a small proportion of the higher alcohols, propyl and butyl are also formed. These alcohols are at present being commercially produced in this way. Further possibilities just being commercially developed are the production of still higher alcohols and acids. Attempts to synthesize long chain alcohols have a tendency to result in the production of complex mixtures difficult to purify.

About 1.1 million tons of nitrogen or a little more than one-half of the world's production of fixed nitrogen was produced as ammonia during the year 1934-1935.[15] Figures compiled by the Chemical Division of the United States Tariff Commission give the installed synthetic ammonia production capacity in the world as 3.2 million tons of nitrogen per year. The distribution of capacity by sources of hydrogen is as follows:

Coke oven gas	.96	million tons nitrogen per year
Coke water gas	.71	" " " " "
Brown coal water gas	1.02	" " " " "
Electrolysis, gas cracking and others	.51	" " " " "

The distribution in the United States according to the same source is:

Coke water gas	298	thousand tons nitrogen per year
Electrolysis	8	" " " " "
Cracked natural gas	28	" " " " "
By-product	13.5	" " " " "

Capacity is several times production.

Catalytic oxidation of ammonia with air yields nitric acid. Reaction under pressure and at elevated tempera-

tures with carbon dioxide yields urea which is valuable as a fertilizer and in the manufacture of synthetic plastics.

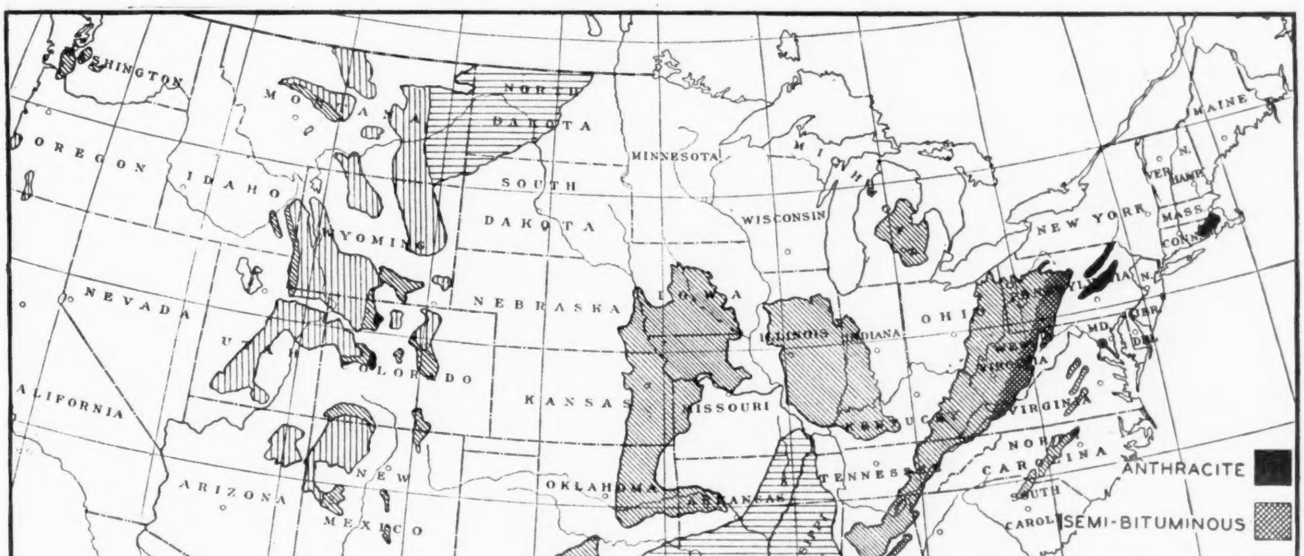
The hydrogenation and destructive hydrogenation of organic compounds comprises a field far too large to be even broadly covered in this paper. It includes such important processes as the hardening of animal and vegetable oils, improvement of lubricating oils, manufacture of hymolal salt detergents, saturation of aromatic compounds to produce special solvents and waxes, and in the manufacture of many synthetic organic chemicals. The recent developments in the manufacture of motor fuel by the destructive hydrogenation of coal in England, Germany and France are placing hydrogenation in the ranks of large scale basic industries. Synthetic motor fuel in Germany amounted to 250,000 tons or one-eighth of the national consumption in 1934. The annual capacity of the Billingham plant of the I. C. I. in England is said to be 150,000 tons of motor fuel per year.

Competing with coal hydrogenation as the source of supply of synthetic motor fuel is the synthesis from carbon monoxide and hydrogen. Technical difficulties have delayed the commercial development of this process but the road now seems clear. The first unit of a four-unit plant being constructed in Germany has an annual capacity of 25,000 tons of motor fuel per year.

It is reported[16] that installations for the production of motor fuel by the Fischer synthesis process now have a greater capacity than do coal hydrogenation plants. The Fischer synthetic process is reported to have a thermal efficiency of only 25 per cent. as against a 40 per cent. thermal efficiency for the hydrogenation process. Other factors enter into the situation, however, among them being the fact that the Fischer process uses coke, in the production of which gas, tar and other by-products have been recovered and the coal or coke used need not have the very low ash content demanded by the hydrogenation process. The 40 per cent. thermal efficiency claimed for coal hydrogenation plants assumes a recovery of hydrogen from the fixed hydrocarbon gases produced in the process. If such recovery is not made the efficiency drops to a little over 30 per cent. A wide range of hydrocarbons, from gases to solids, depending upon the conditions and upon the catalyst used, can be synthesized.

Indications are that further technical developments may be expected in the near future in that class of reactions involving the addition of carbon monoxide or dioxide to an organic compound to form an acid or an aldehyde. Possibilities, for example, are the addition to benzene of carbon monoxide to form benzaldehyde, or carbon dioxide to form benzoic acid. The addition of carbon monoxide to methanol to form acetic acid has already been mentioned.

Production of a finished "coal-tar" dye or chemical



Map showing coal fields of the United States from "The Design of Steam Generating Plants" Part II, "The Three Natural Fuels" by F. H. Rosencrants, published in "Combustion," May 1932, p. 37, probably redrawn from original in colors by M. R. Campbell, U. S. Geological Survey.

involves three stages; first, the working up of the coal tar as received from the coke oven plant into so-called coal tar crudes; second, the manufacture of intermediates from these crudes; and, third, the preparation of the finished material. The coal tar dye and chemical industry sees little, if any, coal-tar. Of the many compounds present in coal tar only a few form the basis for the coal-tar chemical industry. These are benzene, toluene, xylene, naphthalene, anthracene, phenanthrene, carbazole, phenol, cresol, and the xylenols and a few others in very minor quantities.

The mainstays of the coal tar distiller's business are bulk products such as creosote oil, road tar, refined and roofing tars and pitches, pitch coke and light oils. The compounds used by the intermediate manufacturer make up a very small part of his business. According to the figures of the United States Tariff Commission, the United States coal tar production for 1934 was distributed as follows:

Production	409 million gallons
Refined	273 " "
Used as fuel	109 " "
On hand	27 " "

Assuming a specific gravity of 1.1 for coal tar the 273 million gallons distilled weigh 2,503 million pounds. This does not include the weight of refined products from light oils and crude naphthalene produced at the coke ovens and which are the raw materials for a large proportion of the intermediates produced. This weight of intermediates produced in the United States in 1934 was 407.7 million pounds and the weight of finished products 187 million pounds. The Coal Research Laboratory of Carnegie Institute of Technology has compiled a chart which graphically shows the relationships between the quantities of coal, coke, coal tar and other by-products and coal tar chemicals for a "normal" year.

It is highly improbable that this or the next generation need feel concern over a possible shortage of coal. This does not give us license to squander our fuel resources. Even now we are seeing the end of some of the best coals. Coal mined in the future will come from less and less desirable seams and areas and may become more expensive. To keep quality at its present level or better, more efficient cleaning and preparation plants will have to be installed.

Accurate and reliable statistics on most phases of the coal industry are readily available in the reports of the U. S. Bureau of Mines and of similar institutions in other countries and in trade journals. Briefly the U. S. production of bituminous coal in 1934 was just under 350 million tons produced mainly by the states of West Virginia, Pennsylvania, Illinois, Kentucky, Ohio and Indiana, listed in the order of their importance in production. These states accounted for approximately 85 per cent. of the United States production of bituminous coal.

A recent estimate[17] of the world's coal reserves is presented in the table on page 240. The relative reserves of the various countries and continents are graphically shown on page 239. If one considers the great importance of her brown coal deposits to Germany at the present time and the tremendous and almost untouched reserves in the United States we can appreciate what an important fuel back-log these low-grade fuel deposits in our western states may become. Their present lack of development is due largely to their geographical position away from centers of population and industry.

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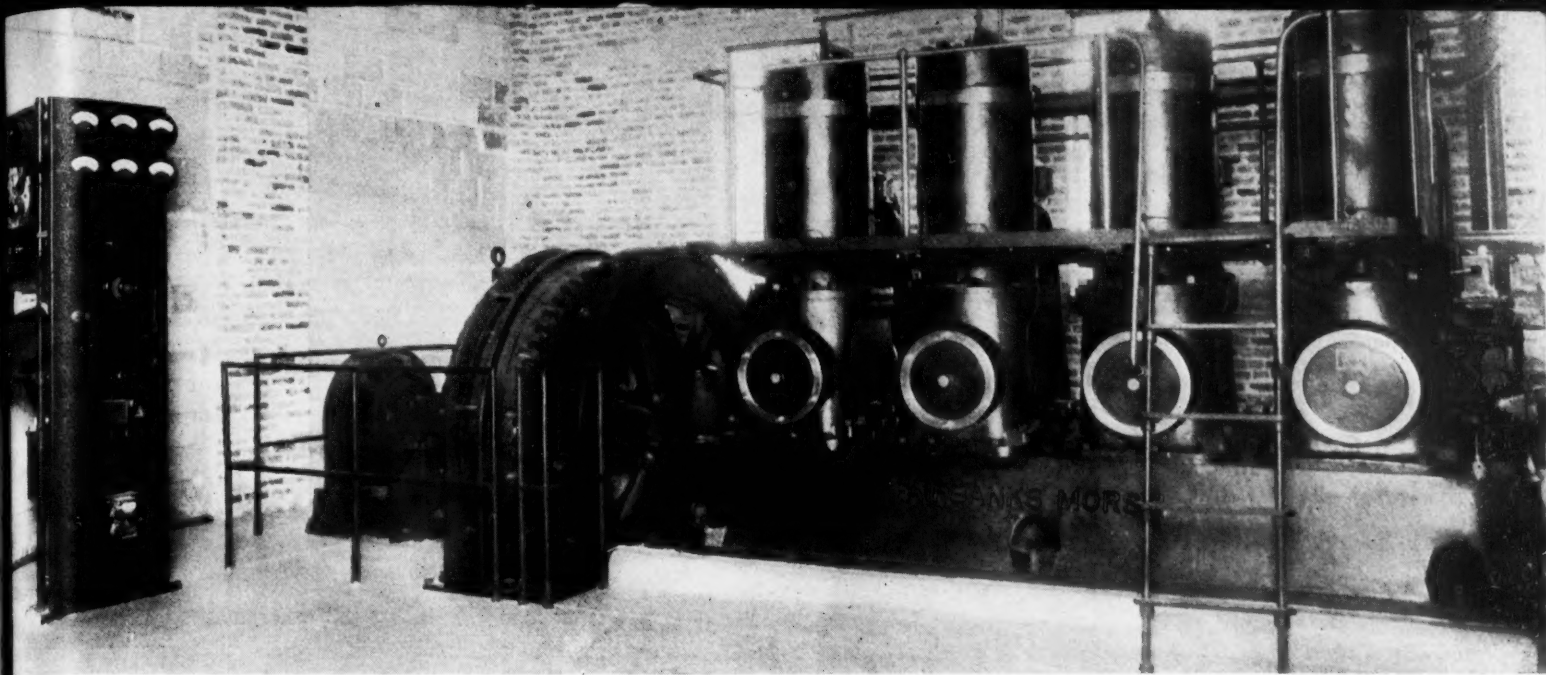
Glycerine Simplifies Vulcanizing Process

A departure from regular methods of vulcanizing and curing rubber which is expected to be of particular value for experimental work and other small-scale operations is the use of a hot liquid bath of glycerine. This process, which has given excellent results in practical application, greatly simplifies the processing by eliminating the vulcanizer and the air-bath. In a technical treatise on the manipulation of India rubber and the preparation of rubberized fabrics, Dr. T. O'Conor Sloane, expert on problems of rubber processing, emphasizes the importance in this process of a fluid which will not act injuriously upon the rubber and which will give a curing temperature without boiling away.

The use of glycerine meets both these requirements since it is not only entirely safe for use with rubber but, having a high boiling point of 290° C., can be heated to the necessary degree. The directions for glycerine-curing, as given by Dr. Sloane, are comparatively simple.

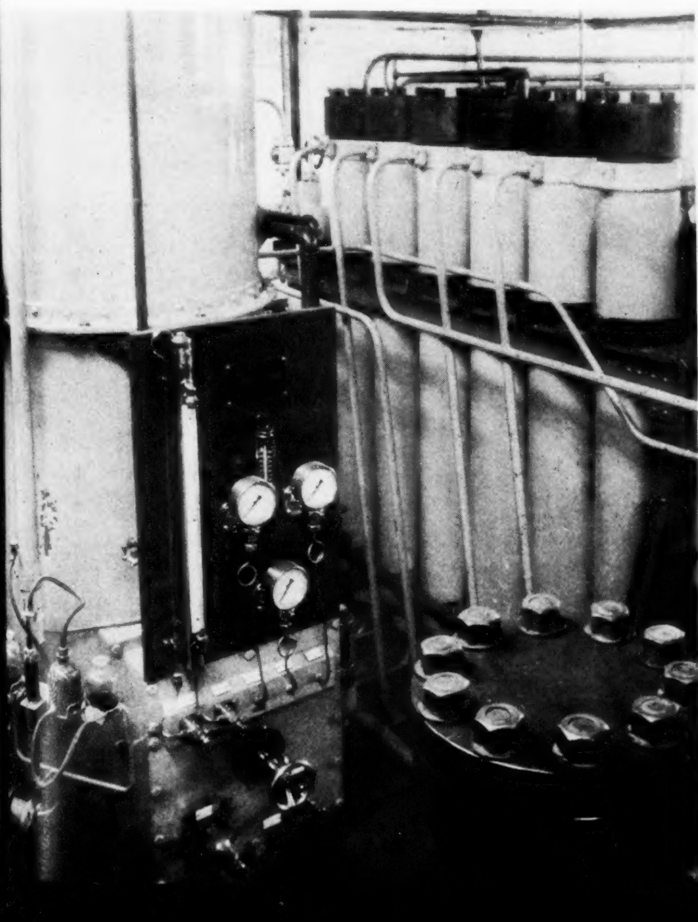


Diesels Saved Money and Provided Flexible Power

By Albert H. Steinbrecher

Vice President, Operations and Engineering, Compressed Industrial Gases, Inc.

MANUFACTURED as oxygen and hydrogen are in large quantities at the plant of the Wisconsin Oxygen-Hydrogen Company, at Kenosha, subsidiary of Compressed Industrial Gases, Inc., considerable current is required for this purpose. Both electrolytic and atmospheric processes are used at this plant as occasion demands. The capacity of the liquefaction plant (using the atmospheric method) is 27,500 cu. ft. of oxygen per day, operating 24 hours, equivalent to 125 standard oxygen cylinders. The electrolytic plant's capacity is about 250 standard hydrogen cylinders and 125 oxygen cylinders, bringing the total plant capacity to 500 cylinders a day.

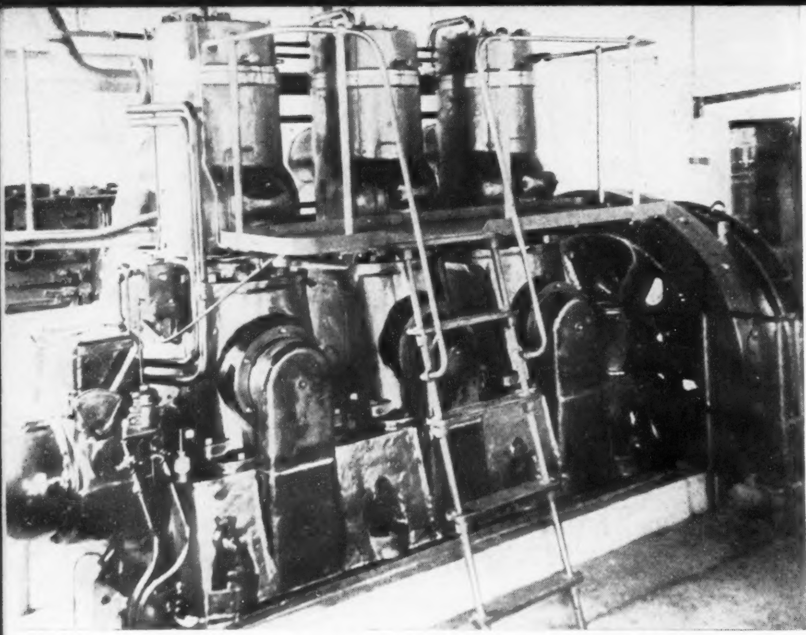


Installation at this plant of two Diesel generating units, after having operated fifteen years on purchased current, has given ample proof that savings may be effected through the use of Diesel generated power as against central station current. One of these units is rated at 210-hp. or 172 kv.-a. at 80 per cent. P.F., while the other is rated at 280-hp. or 230 kv.-a. at 80 per cent. P.F. Direct-connected 10-kw. exciters supply the necessary excitation, furnishing current at 125 volts.

The circulating water in the engines is cooled by two towers, which may be used interchangeably with either Diesel unit, and which provide sufficient facilities for cooling the water to the required temperatures regardless of season or load conditions. One tower is equipped with a constant-speed motor-driven propeller-type fan: the other, with a two-speed motor-driven propeller fan.

The two sizes of engines make it possible to adjust the operation of the power plant to the load requirements, which vary widely according to the processes used—whether electrolytic or liquefaction—which in

Left, compressor room. Above, the 280-h.p. 4-cyl. Diesel generating unit furnishing power for the electrolytic process.



The 210-h.p. 3-cyl. Diesel generating unit used in connection with the compressor units in liquefaction plant.

turn depends upon the market demand for oxygen as compared with hydrogen.

Oxygen and hydrogen, by the electrolytic method, are produced by passing a direct current through a solution of water and caustic soda. The oxygen is captured from the positive pole and hydrogen from the negative pole in the following proportions, two parts by volume of hydrogen and one of oxygen. These are prevented from mixing by an asbestos diaphragm placed between the poles. The gases are then collected in pipelines, carried to their respective gas holders, each having a capacity of 5,000 cu. ft., into compressors and from there, with the aid of a 10-cylinder charging manifold, are compressed into the cylinders. In the electrolytic process the oxygen and hydrogen are carefully tested for purity every hour as they come from the cells and enter the holders; again as they pass from the holders to the compressor; and once more as they go to the charging manifold. The plant standard of purity is 99.7 per cent. for oxygen and 99.9 per cent. for hydrogen, easily meeting the requirements for industrial and medical uses. To facilitate the following through of the processes, the pipe lines for the various purposes are each given their individual colors: yellow for the air line; black for the conduits on the electric line; blue for the water line; green for the oxygen lines; and red for the hydrogen lines. The distinguishing colors are also employed for respective cylinders, red for hydrogen and green for oxygen.

Electrolytic Process Satisfactory

This electrolytic process is highly satisfactory under certain market conditions. By this method the quantity of hydrogen gas produced is twice that of oxygen. Hence the cost of producing oxygen by this method is double that of hydrogen. All goes well when the market for these products is in just that relative proportion. When, however, the demand for oxygen is greater in proportion than one for two of hydrogen, then a problem presents itself and an adjustment must be made. Under such conditions the additional oxygen required is manufactured by the liquefaction method, since the cost of producing it alone by the electrolytic process is prohibitive.

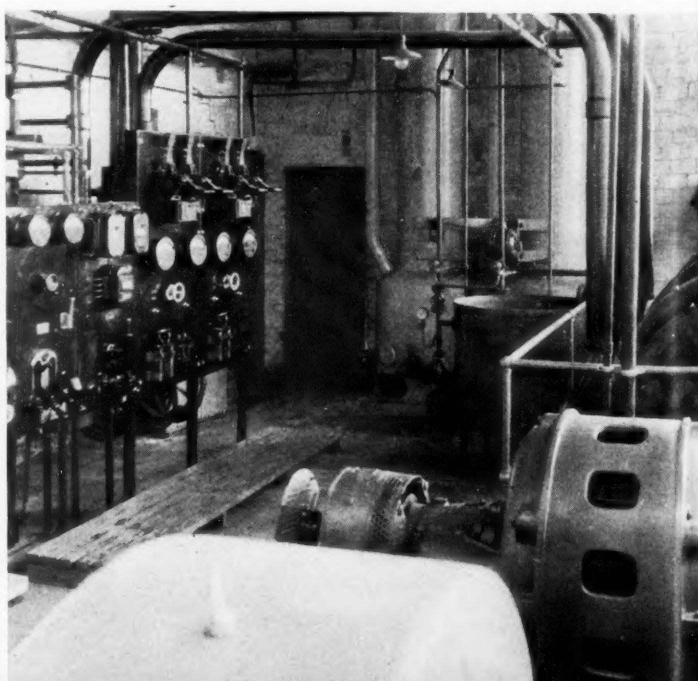
The liquefaction process uses atmospheric air. The air is drawn into a compressor and from then on it is a process of compression, expansion, and distillation, during which the air liquefies and later again gasifies, and the oxygen is separated from the nitrogen. The oxygen is then allowed to pass into gas holders, thereupon is re-compressed to a pressure of about 2,000 lbs. and passed into cylinders for the market. The nitrogen produced is discharged as waste. Oxygen when made by this method is, of course, tested hourly for purity as carefully as when made by the other method.

Because it is necessary to shift from one method to the other, the plant faced a problem of extreme flexibility. Installing the two generating units has solved that problem. The power consumption when operating at capacity, 24 hours a day, is comparatively even. When, however, it is necessary to start and stop, due to variations in the demand for the products, then there is a heavy consumption of current for a period until the compressor plant gets on a normal production basis. Reliability of service was, therefore, one of the problems to be solved, as no provision for standby service was made—a shutdown or any interruption of power service would mean a loss of several hours of production and a greatly increased demand for power during the time it would take the compressor to again acquire normal action.

Possible Savings

As to savings: the current delivered when purchased power was used was through service lines at 26,400 volts, brought down to 440 volts through oil-cooled transformers. The average cost per kw-hr. amounted

General view of generator room.



to 1.225 cents, net. With the Diesel engine equipment the power output averages 12 kw-hr. per gal. of fuel, at a delivered cost averaging in the neighborhood of 5¢ per gal. bringing the average cost of current to a small fraction above .6 cents per kw-hr. after deducting all fixed and operating charges.

Liquefied Petroleum Gas Sales Increase

Sales, or the marketed production, of liquefied petroleum gases for domestic, gas company, and industrial uses, reached 76,855,000 gallons in '35, or 20,428,000 gallons (36.2 per cent.) more than the '34 requirements of 56,427,000 gallons, according to reports submitted to the U. S. Bureau of Mines. The fast-growing market for liquefied petroleum gases during recent years is illustrated in the following table.

Table I—Sales of liquefied petroleum gases, 1930-1935, in thousands of gallons

Year	*Propane*	*Butane*	*Propane-butane mixtures*	*Pentane*	*Total*
1930	11,500	.....	[1] 6,517	....	18,017
1931	15,000	.....	[1] 13,770	....	28,770
1932	15,182	14,662	3,417	854	34,115
1933	15,835	19,056	3,226	814	38,931
[2] 1934	25,845	25,553	3,107	1,922	56,427
1935	34,655	34,084	5,651	2,465	76,855

[1] Butane, propane-butane mixtures and pentane.
[2] Revised figures.

The respective demands for the several liquefied gases included in this annual study, all showed substantial gains in '35 over the previous year. Deliveries of propane increased 34.1 per cent., or from 25,845,000 gallons in '34 to 34,655,000 gallons in '35, while butane sales showed almost an identical raise, with an increase of 33.4 per cent., to a total of 34,084,000 gallons in '35, compared with 25,553,000 gallons in '34. The market demand for propane-butane mixtures nearly doubled, increasing from 3,107,000 gallons in '34 to 5,651,000 gallons in '35. Sales of pentane totaled 2,465,000 gallons in '35 against 1,922,000 gallons in '34.

The industrial use of liquefied petroleum gases was outstanding in '35 when 47,894,000 gallons or 62.3 per cent. of all deliveries fell under this classification, compared with 32,448,000 gallons or 57.5 per cent. in '34. The domestic use of liquefied petroleum gases increased from 17,681,000 gallons in '34 to 21,380,000 gallons in '35, but the ratio to total deliveries declined from 31.3 per cent. in '34 to 27.8 per cent in '35. The quantity used in gas manufacturing increased from 6,298,000 gallons in '34 to 7,581,000 gallons in '35.

The most important present use of propane gas is for domestic purposes, although the requirements in the industrial field are rapidly mounting. In '35, 18,325,000 gallons of propane, or about 53 per cent. of the total deliveries, were credited to domestic uses, which compares with 15,236,000 gallons, or 59 per cent. in '34. During the same years the industrial use of propane increased from 10,283,000 gallons, or 40 per cent. of total deliveries in '34, to 15,628,000 gallons or 45 per cent. of the total in 1935.

Butane is used principally as an industrial fuel, 27,689,000 gallons out of total deliveries of 34,084,000 gallons, being consumed in '35 compared with 19,443,000 gallons in '34 out of a total of 25,553,000 gallons. Sales of butane to gas manufacturing plants declined from 5,064,000 gallons in '34 to 5,042,000 gallons in '35, but deliveries for domestic purposes in '35, although small in volume, registered a 30 per cent. gain over '34.

The use of "bottled gas," usually propane, continued to increase in '35, as householders, campers, and other consumers, cut off from gas-company mains, became even better acquainted with this convenient fuel. Manufacturers used both propane and butane in rapidly increasing quantities in '35, in the solution of their heat application problems, especially in such processes as annealing, brazing, carburizing, metal cutting, and preheating, where controlled temperatures are important. Liquefied petroleum gases are being used as the raw material in the manufacture of an increasing number of chemical products. Petroleum refiners are finding ever-widening uses for propane and butane and are realizing that these products are too valuable to use as refinery fuel. Propane is used as a solvent and refrigerant in the refining of lubricating oils. The polymerization of butane in the manufacture of high grade blending materials for motor fuel was transformed from the laboratory to the commercial stage in '35. Although it may be some time before polymerization will restrict the supply of liquefied petroleum gases, it has greatly enhanced the economic importance of butane.

The American Gas Association has furnished the Bureau of Mines the following data regarding the distribution of liquefied petroleum gases:

"At the end of '35, liquefied petroleum gas was being delivered through mains to consumers in 163 communities in 29 States by 68 companies supplying 29,516 customers.

"Butane-air gas with heating value ranging from 520 to 900 B.t.u. per cu. ft. was supplied to 105 communities in 28 States by 57 companies. A mixture of undiluted butane and propane gas with a heating value of 2,800 to 3,000 B.t.u. per cu. ft. was supplied to 14 communities in California and Nevada by 6 companies. Undiluted propane gas with a heating value of 2,550 B.t.u. per cu. ft. was supplied to 44 communities in Maryland, Minnesota, New Jersey, North Dakota and Wisconsin by 5 companies."

Shipment in Bulk Increases

The shipment of liquefied petroleum gases in bulk, that is, by tank cars, tank wagons, and pipe lines showed a 50 per cent. increase in '35 compared with '34, while cylinder and drum shipments remained practically the same in '35 as in '34. This was to be expected as the same market conditions prevailed as in '34, when the larger share of the increase in deliveries was confined to the industrial field where bulk shipments predominate. The tank car and tank wagon movement of liquefied petroleum gases totaled 61,457,000 gallons, or 80.0 per cent. of all deliveries in '35, compared with 41,048,000 gallons or 72.7 per cent. of the '34 total. Cylinder and drum shipments were approximately 15,000,000 gallons for both '34 and '35, but the percentage of such deliveries dropped from 27.3 per cent. in '34 to 20.0 per cent in '35.

Thirty distributors of liquefied petroleum gases, 12 of which operate in the Pacific Coast area, furnished the statistical data embodied in this report for '35. A regional analysis of the distribution of liquefied petroleum gases shows deliveries in the Pacific Coast area totaling 17,678,000 gallons in '35, compared with 11,471,000 gallons in '34. The increase in the California area of over 6,000,000 gallons was confined largely to industrial uses, although gas companies required about 1,700,000 gallons more of liquefied gases in '35 than in '34. The demand for liquefied petroleum gases east of the Rocky Mountains totaled 59,177,000 gallons compared with 44,956,000 gallons in '34. In this gain of 14,000 gallons, propane sales account for about 7,800,000 gallons, and butane about 5,300,000 gallons. The industrial demand for liquefied gases in this area increased 11,000,000 gallons in '35 compared with '34, while deliveries for domestic use were greater by 3,500,000 gallons in '35 than in '34. The use of liquefied petroleum gas by gas companies east of the Rockies declined 420,000 gallons in '35 from the previous year.

An Interview with Enoch Perkins on

New Caledonia

Where Chrome and Nickel Come From

LEAN and sinewy, born in a Colorado mining camp, son of a mining engineer, but with the twang of his New England ancestry still in his voice, Enoch Perkins, manager of the Mutual Chemical Company's chrome mines in New Caledonia has been in New York, visiting "headquarters" from his post in the South Seas almost exactly on the opposite side of the globe from the offices at 270 Madison Avenue. He is an interesting man with an interesting job.

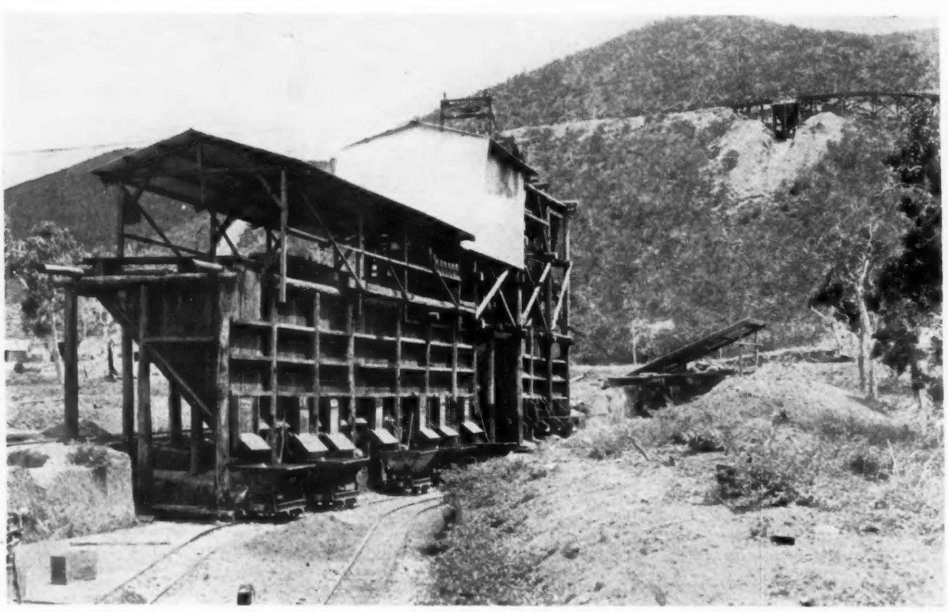
He has practiced mining engineering in Alaska, in the New Jersey and Missouri zinc fields, and for the past fifteen years in New Caledonia. He likes it "out there," though he confesses that he has never learned to relish those two great native delicacies, fried flying fox and boiled octopus; and he admits he enjoys to come back every two or three years to check up on Broadway, new equipment, and production programs.

His hobby is photography and (as these pages attest) he is an expert. His cameras range from little, super-speed "candids" to cumbersome plate affairs, with a couple of "movies" in between; and if he is proud of anything outside his production sheets and the health record of his hundreds of laborers from Indo-China, it is his pictures of native life and some views he took down in the mines where the humidity was so high he must of necessity shoot snapshots before the moisture condensed on his lens. He knows his New Caledonia and his job; likes both; talks well about either.

"New Caledonia," he said, "is just about as far away from Manhattan Island as a man can get and still stay on the earth. You need a month and half to get there from New York. It's 1000 miles from Australia and 750 from the Fijis. It is 250 miles long and averages 30 miles, being the largest island, except New Zealand, in the Pacific. Like many South Sea islands it is mountainous, the highest peak, Mt. Paine, reaching 5412 feet above the sea.

"It's a curious land, one of the oldest in the world. For example, we have beautiful coniferous trees which are found nowhere else. But their fossils have been dug up in Europe. Originally New Caledonia was joined with Australia to the south and to the north with the Malay Peninsula; but a famous British botanist in a year's stay found on the island over two hundred and fifty plants endemic to the island from which it is deducted that the separation took place very long ago. We are completely surrounded by a coral reef (only exceeded in size by the Great Barrier Reef of Australia) which is broken by passes opposite the mouths of the river.

"But I suppose your readers would be more interested in our chrome and nickel mines with possibly,"



New Caledonia mining is the home of the jig-back.

he added with a twinkle in his eye, "just a word or two about the cannibals and the native dances.

"Well, the nickel comes first in point of time, though with the increased use of chrome for plating and in its chemical salts today our ore is our most important export. Nickel was discovered by Jules Garnier in 1865, but the first exports were made in 1875. From then till 1887, when Sudbury came into production, the nickel industry was most prosperous. Original shipments were of ore, often running as high as 12%, but smelters have been installed and no ore is now shipped. It occurs as garnierite, a hydrate of nickel and magnesia, an alteration product from the weathering of serpentine in which the iron has been replaced by nickel. Mining is quite like gardening with benches cut along the contours, the overburden removed, and the ore shoveled in rocker dump cars which are hand-trammed to jig-back ropeway loading bins which deliver it to the railroad. New Caledonia is the home of jig-backs. All mines use them. The ore is hauled by rail to stock piles on the beach, loaded into 60-ton lighters, towed alongside 2000-ton barges at anchor inside the reef. These barges are old steel sailing ships which came out from the United States under sail loaded with lumber. They are towed down the coast to the smelters operated by the Societe Caledonickel, a merger of two companies of the Ballande and Rothschild interests.

"Garnier also discovered chrome during his study of the colony's resources 1863-66, and the first mine of consequence was Lucky Hit, near Plum in the South, opened by Mr. Bernheim in 1880. Twenty years later, on the Tiebaghi Dome in the North, two mines, Morracchinni and Ville Montagne were opened, followed in 1902 by Mr. Bernheim's Tiebaghi. This has enjoyed the distinction of being the largest and richest chrome mine in the world, having produced over a million and a half tons of ore of over 55% Cr_2O_3. This is the active chrome mining section to-day and here the Mutual Chemical group of mines is located. In recent years we have been shipping about equal quantities with

Some of the mine workmen have tattooed on their faces the secret marks of cannibalism.

the Tiebaghi. The United States takes most of the New Caledonia chrome for both chemical and metallurgical uses. The Mutual Chemical Company supplies not only its own needs for the manufacture of the highest grade ———"

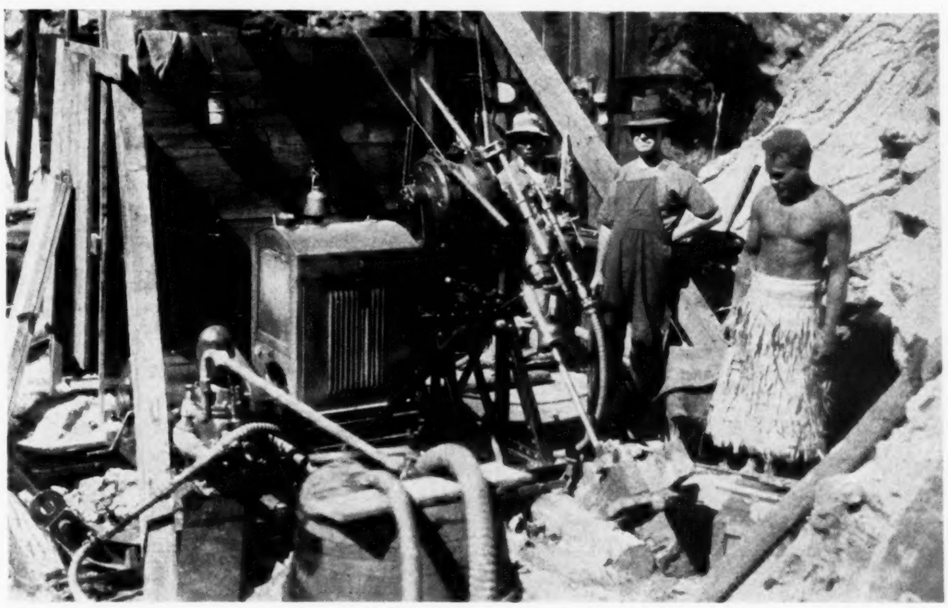
"But what about the cannibals?"

He laughed heartily. "No advertising, eh?"

"Well, not too much."

"All that sort of thing—I mean cannibalism—is a thing of the past. Well, possibly in some remote part, off on a well secluded island—but not in New Caledonia. Although we do have old men working for us who have a peculiar tattoo mark on their faces which is said—" he shrugged his shoulders.

"The natives belong to the Melanesian race and are a fine people, likable and interesting. Mentally they are lively children with a keen sense of humor. The men are vain and beautify themselves according to their lights. Milk of lime is a favorite hair tonic. It turns



The mine head at the Mutual Chemical Company's chrome mines.

their black hair a henna red and also routs the little beasties usually found therein. All sing beautifully, harmonizing perfectly, and a group singing away as they enter the harbor in their strange sailing boats, or gathered about a fire in the unbelievably beautiful tropical moonlight, must be heard to be appreciated.

"Our climate is as perfect as the best claims of Florida and California—the temperature has no extremes, the mean maximum being 83 and the mean minimum 63. The waters swarm with fish and abound in shrimps and oysters. All sorts of tropical fruits grow wild—oranges, lemons, limes, bananas, mangoes, alligator pears, custard apples and what not. Meat is sold on a sort of mail-order plan, the order being written in two books, one for the family and one for the servants, which the butcher collects from a box near the street in time to fill it next morning. Beef is available six days a week. Mutton on Wednesdays only, Thursday for veal, and Saturday for pork. So your appetite must be adjusted accordingly. The stores are stocked with all sorts of wares from England, France, and the United States. Champagne costs two dollars a bottle and best wines and liquors at correspondingly low prices. We live well and reasonably.

Natives in the belt line handpicking the chrome ore.

"We have tennis and soccer and horse racing; all kinds of fishing and bird shooting; many deer for big game hunting. Social life among the French colonial officials and the employees of the mines and plantations is extremely pleasant, and even if we are six weeks behind the times—I mean that literally, for our newspapers are all six weeks old—life in the New Caledonia chrome mines isn't too bad at all."

Salt Production '35

To supply the mineral industry with data on salt production and markets during the past year, the following information is furnished by the U. S. Bureau of Mines.

Salt produced for sale or use by operators of salt mines, wells, and ponds in the United States in '35 totaled 7,926,897 short tons valued at $21,088,641, an increase of 4 per cent. in quantity but a decrease of 8 per cent. in value compared with '34 (7,612,074 short tons, $22,850,797). The output of evaporated salt in '35 (2,330,042 tons valued at $14,448,910), representing 29 per cent. of the total quantity of salt produced, increased 2 per cent. in quantity but decreased 2 per cent. in value compared with '34 (2,281,453 tons, $14,771,502). The salt content (3,837,613 tons) of the brine produced and used by producers in the manufacture of chemicals represented 49 per cent. of the total salt output and increased 12 per cent. in quantity over '34 (3,417,439 tons). Rock salt produced (1,759,242 tons valued at $5,085,184), amounting to 22 per cent. of the total output, decreased 8 per cent. in quantity and 19 per cent. in value from '34 (1,913,182 tons, $6,306,095). The average value of all salt in '35, $2.66 a short ton, was 34 cents less than in '34; that of evaporated salt, including pressed blocks from evaporated salt, was $6.20, 28 cents less than in '34; and that of rock salt was $2.89, 41 cents less than in '34.

Seventy-four plants (61 companies) reported operations in '35 compared with 73 plants (61 companies) in '34.

Production of bromine in '35 amounted to 16,428,533 pounds valued at $3,483,239, an increase of 7 per cent. in quantity and 8 per cent. in value over '34 (15,344,290 pounds, $3,227,425).

Imports of ethylene dibromide in '35 amounted to 477,005 pounds valued at $89,810, compared with 649,987 pounds valued at $143,164 imported in '34. Imports of potassium bromide in '35 amounted to 8,910 pounds valued at $2,904; in '34, 4,410 pounds valued at $1,047. There were also imported in '35 22 pounds of raw bromine valued at $22; 2,000 pounds of sodium bromide valued at $530, and 5,310 pounds of other bromine compounds valued at $8,664.

Production of calcium chloride from natural brines in '35 was reported as 83,546 short tons valued at $1,039,103, an increase of 9 per cent. in quantity but a decrease of 10 per cent. in value compared with '34 (76,719 short tons, $1,153,159).

Imports of calcium chloride in '35 amounted to 2,003 short tons valued at $26,987, compared with 1,975 short tons valued at $26,271 imported in '34. Exports in '35 amounted to 30,735 short tons valued at $525,179, compared with 30,715 tons valued at $566,189 imported in '34.

The sales of domestic production of iodine in '35 were 245,696 pounds valued at $248,654, compared with 284,604 pounds valued at $342,957 in '34, a decrease of 14 per cent. in quantity and 27 per cent. in value.

Imports of crude iodine amounted to 375,819 pounds valued at $420,793 in '35, compared with 1,481,123 pounds valued at $2,134,979 in '34, a decrease of 75 per cent. in quantity and 80 per cent. in value. All the iodine imported in '35 was from Chile where it is obtained as a by-product at nitrate plants.

What Is Research And Why

By Gilbert Amerman

Industrial Engineer, Felton Chemical Co., Inc.

RESEARCH is a great deal more than an investigation of chemical reactions and their application on a plant scale. It is a continuous search for the one best way of doing every operation necessary for the efficient functioning of an enterprise.

The chemist who holds the title of Research Director in your organization is doing a vitally important job. But his title is wrong. He is the *Chemical* Research Director. Research in its broader sense is your job. And yours too, Mr. Department Head.

Your competitors are all sold on chemical research and you meet competition by maintaining it. But few competitors are applying the concept of research to all branches of the chemical business in a scientific effort to eliminate inefficiency and waste, and to obtain maximum profits. Here is an opportunity for truly aggressive strides in the race for profits as the reward of superior management. Demand continual study and improvement in the production, financial, and sales departments, and in the coordination of these functions. This policy can be formulated and applied only by the higher management.

Let's ask ourselves a few questions which will require research outside the chemical laboratory. It is often as important to know the questions as to know the answers. In other words, complete statement of the problem will lead to recognition of the type of research to be undertaken to get the answer.

Should your organization exist?

You've probably never given this question serious thought and may even consider it ridiculous. Yet the profit and loss results shown by many organizations clearly indicate that early liquidation is the only means of preserving the residue of the owner's capital. Chronic losses not due to the business cycle or temporary conditions peculiar to the industry leave only the alternatives of poor management or an inherently unprofitable business. The former condition may be remedied. But the latter requires either liquidation or a shift to another type of activity. This applies to insufficient profits as well as losses. The money market furnishes a definite return over a given period for an investment of given risk. If the owners receive a lesser return on their invested capital, discontinuance of the enterprise should be seriously considered. Businesses, as well as individuals, may not be dying; but still be too sick to get results. "Kill or cure" is preferable to prolonged agony.

What size should your business be?

Have you ever seriously studied the relationship between magnitude of operations and net profit for your organization? The economic law of diminishing returns is quite simple. As the magnitude of operations increases, net profit per dollar of investment increases until it reaches a maximum. Then it declines to zero. Beyond the maximum point, each dollar invested still yields a profit, but a continually diminishing one. The point of maximum net return per dollar invested is not necessarily the optimum. It may be desired to invest less capital and take a lesser rate, or more capital at a lower rate so long as the return is above alternative opportunity. In any case, when additional capital returns a rate less than the minimum required, expansion should clearly be stopped.

So much for theory. Many business men want bigness for its own sake or to keep up with the Joneses, profits being a secondary consideration. But assume you are hard boiled enough to want profits. Get out your records of income, expense, and volume of business over a period of years and plot the two former against the latter in the form of a profitgraph. This will show you the volume of business at which you break even as well as the magnitude of profits above that point for your present capital facilities. You can then approximate your profit or loss for any given range of output for greater or lesser capital facilities. Of course, production cost per unit declines as you increase production and capital. But do not forget that selling cost per unit will go up even faster. Almost any company can double its sales volume, if it is willing to pay the drastically increased sales cost and take the resultant loss. Many are now regretting having done so. Numerous organizations with low fixed charges are taking losses with one hundred employes when they could make comfortable profits with ten. Unless you have the complete story on the functional relationship between income and expense in your business, you have a research job ahead of you. Get the facts and then expand or contract for profit.

What kind of business should you be in?

An established textile mill making modest profits once consulted an industrial engineer to see how their net could be increased. After investigation he recommended: dispose of the mill and concentrate on speculation in inventories. When the directors recovered from the shock sufficiently to analyze the situation, they did so and markedly increased profits. Excellent profits had resulted from inventory speculation but manufacturing had been done consistently at a loss—the result, small profits. Elementary when disclosed, but this had been going on for twelve years!

Know how much net profit, or loss, each branch of the business contributes. Then decide whether it should be expanded, contracted, or dropped. Even though a loss is incurred, you may be better off with it than without it because of the overhead that would have to

be charged against other departments in its absence. In that case consider the possibility of substituting or of gradually disposing of the facilities over a period of time. In any case, savings can be effected by removing sales pressure from the line.

Be sure to separate financial, manufacturing, and sales costs and results. You may find most of the trouble in a single division of the business. You may be able to remedy the condition or possibly you can operate more profitably if some one else does your manufacturing or your selling for you. Don't assume you have to continue manufacturing a certain chemical, or a group of chemicals, just because you have always done so. Inertia and habit do a lot toward maintaining a business with minimum expenditure of effort, but they are of little value in pushing it ahead.

Do you have financial control?

Of course you have an accounting system and receive periodic reports, but what is accounting for? Computation of profit and loss and a listing of assets satisfy the taxing authorities and tell you the final result of operations. But they do not tell you why and what to do about it. Control requires quantitative measurements and involves more engineering than accounting. For every function and every major division of a function you need:

(1) A definite standard of accomplishment
(2) A means of measuring deviations from this standard, and
(3) A mechanism for getting required results.

You take each of these steps at target practice by:

(1) Setting up a bullseye and aiming at it
(2) Checking the shot to determine deviation from the bullseye, and
(3) Modifying your aim to do better next time.

Now apply this idea to your business by giving your key men something to shoot at.

Accounting and statistical records tell you what has happened in a given department, but the information does you little good unless you know what should have happened. The usefulness of standard costs depends entirely on the accuracy of the standards. Thus a budget based on past performance is simply a comparative study of history. Forget accounting at the outset and carefully study the methods in use in a selected department. Study every operation until you are convinced that it is being done in the one best possible. Then determine the time necessary to complete it. You will now know what constitutes a day's work for every worker and what the department should be expected to do in any given number of man-hours. After standard performance is known, a statistical or accounting system can determine actual results and compare them with standard. All material deviations must be explained in terms of individual responsibility.

Perhaps you do just this in your factory. But that is only half the battle. The same analysis must be applied to the sales, clerical, accounting, and financial functions. No task of any appreciable magnitude should be excluded. If you cannot differentiate good performance from bad on a scientific basis, you are not managing.

Is your office productive?

Nearly half a century elapsed between the first organized efforts to standardize factory operations and the first similar attack on clerical operations. The office manager has frequently been a routineer whose principal qualification was length of service with the company, by virtue of which he was able to remember the details of complicated routines as they had been performed for the last few decades. The function fell into such disrepute that capable executives frequently refused to be associated with it. It acquired the reputation of a necessary evil, an unproductive series of operations to be memorized by those involved and ignored by the "money making" part of the organization.

Office management is what you make it. Use the same control that you use in the factory: standardize and measure. Clerical operations are not fundamentally different from manufacturing ones. If you don't measure clerical performance, you are missing a good opportunity to increase the black figures on your income statement.

How fast does your organization change?

Take each major department and ask: how many major improvements have been installed in the last year or two. Conditions are changing rapidly. Absence of change in any activity is *prima facie* evidence of stagnation, if not degeneration. Possibly the executive responsible has not been encouraged to keep abreast of the times. Expect continual progress in his department and tell him you will stand squarely behind his efforts to stimulate efficiency.

Your job is to sell progress to your key men. Stimulate competition between departments and individuals. If a number of department heads report improved methods at a committee meeting, the others will be stimulated to have something of value to report next time. A periodic written report on improved methods developed is helpful. Assemble the intelligence of your organization and use it for profits.

What is your own pet weakness?

The most difficult problem in coordination of a manager is to maintain a balance on the basis of the importance of each to the enterprise. Most department heads have been engaged largely with a single function before graduating to administration and hence are prone to place undue emphasis on the particular division with which they have been most intimately concerned. Consider your background. Then take care that your decisions are not unduly influenced by this bias.

Production troubles?

Chart the progress of important materials from the receiving shed until they leave the plant as finished goods. Do the same for the sequence of manufacturing operations and for the manufacturing personnel. Do materials flow in a short, fairly straight path or do they follow jagged irregular lines with frequent backtracking? Check the sequence and nature of productive operations for possible improvements. Note where and how your labor is being applied. Write out the system for routing, scheduling, and production control, and try to find the weak points, particularly in the light of previous and current difficulties, for which the cause must be determined. Of course, all this would normally be done as part of the standardization operation.

Sales troubles?

Do you know the potential market for each chemical you make in terms of geographical location, type of customer, and optimum merchandising effort for each? Thus only can sales effort be pushed most where resistance is least. Do you know the cost of selling each major item in the line as well as its plant cost? Profitable items should be pushed and unprofitable ones dropped or supplied only on request if customer good-will requires their maintenance.

Analyze the account of each important customer to get profit results in terms of customers by types and also in terms of order size. Customers whose accounts are unprofitable need not be dropped, but solicitation may be reduced or omitted. One organization turned a loss into a profit by the simple process of dropping eighty per cent. of its customers. The remaining twenty per cent. had contributed most of the dollar volume of orders. Excellent profits had been more than dissipated by soliciting the other small buyers at a heavy loss. Know the performance of individual salesmen, even if on a straight commission basis, so that you know whether or not the potentialities of each portion of the market are being realized.

What are you going to do?

In three ways you can attack this problem. Uncover some one in your organization with requisite training and ability to undertake the task. Add an industrial engineer to your staff, probably with other duties in the small or medium sized organization. Engage a consultant. But however you go about it, beware of the man who tries to sell you a ready-made system that has been installed in other plants. It will fit your business about as well as your neighbor's suit will fit you. Don't buy a system. You need an attitude of mind.

Don't be deluded by profits. You probably should be making more. Inadequate profits are money out of pocket in the same sense as losses. Performance of your competitors is no adequate criterion. You may have, or may be able to acquire, some advantage that would warrant greater profits. Better management is an excellent advantage to acquire.

Of course your business is different. They all are. But the same principles of effective control apply to every type of economic activity. And research in the broad sense of seeking the one best way to do every job is the key to profits in any business.

Industry's Bookshelf

A Laboratory Outline of Smith's College Chemistry by James Kendall (3rd Ed.), 198 pp., Appleton-Century, $1.50.

Following the latest revision of Smith's widely used text, this laboratory handbook continues to be one of the most useful of its kind.

America Must Act by Francis Bowes Sayre, 80 pp., World Peace Foundation, $.75.

A challenging statement of what America must do to lead the march of world recovery which strikes a warning note. Discussion of America's need for increased world trade as well as economic self-sufficiency is well balanced.

A Textbook of Pharmacognosy by J. W. Cooper and T. C. Denston with illustrations and drawing notes by M. Riley and D. W. Shaw, 522 pp., Pitman, $5.

Intended for students preparing for the British Druggist Qualifying Examination, this furnishes a complete listing of pharmaceutical materials, their properties, uses, and the chemistry involved.

Water Purification Control by Edward S. Hopkins, 184 pp., Williams & Wilkins, $1.75.

A needed new edition and up-to-date description of the various systems on practical operation direction.

The Alloys of Iron and Carbon, Volume 1, Constitution, by Samuel Epstein, 476 pp., McGraw Hill, $5.

In this group are the most important commercial alloys and this awaited contribution to the monographs of the Iron Alloys Committee of the Engineering Foundation come up to expectations which were high. Epstein has produced a well thought out, remarkably concise (considering the wealth of subject matter) review of our present knowledge of carbon steels and important metallurgical and chemical contributions.

The Technology of Washing by J. T. Holden and John N. Vowler, 184 pp., The British Launderers' Research Ass'n, London, $2.20.

First of a series of practical hand books to be put out by the cooperative research organization of the British Laundryowners, summarizing the practical technique of washing, plus the latest and most scientific results of researches carried on in this field.

The Economics of Open Price Systems by Leverett S. Lyon and Victor Abramson, 165 pp., The Brookings Institution, $1.25.

A constructive study of open price systems, with particular reference to the NRA experiment. Economic and social issues involved are clearly stated, and a fine analysis of the effect on competition, price stability, and trade practices is included. Lyon and Abramson have made their study at a particularly advantageous moment, and their text is a practical, workable one.

Gypsum

as a

Chemical Raw Material

By J. S. Offutt

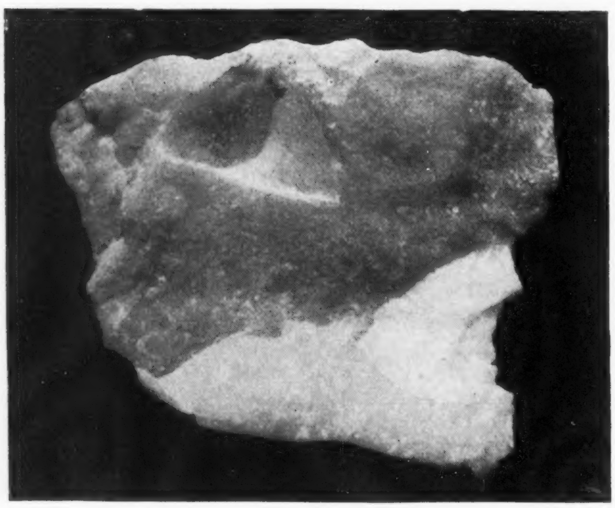
United States Gypsum Company

White gypsum rock.

UNDER the lash of wartime necessity, Germany utilized gypsum as a much needed source of sulfur for the manufacture of sulfuric acid. Her limited pyrites deposits were low in sulfur and difficult to use. Unable to secure sulfur from other countries because of naval blockade, she quickly developed and built a plant where gypsum was mixed with shale and burned in a rotary kiln. Cement was formed from the clinker and the sulfur dioxide was made into sulfuric acid. This undoubtedly is the most advanced chemical use of gypsum to date.

Gypsum has a long and interesting history. Its utilization goes back to the early Egyptian dynasties. Recent discoveries by archaeologists of gypsum plaster coated walls have been dated at 4000 B. C. The beauty, translucency and ease of carving made alabaster gypsum a widely used material by the ancients.

Gypsum, the geological name for the dihydrate of calcium sulfate, is taken from the Greek word "gypsos," meaning chalk. It is a soft, usually a white mineral, and is found in five forms, (1) massive gypsum—the most common; (2) selenite—transparent, cleavable form, usually colorless; (3) alabaster—massive, fine grain, usually white and translucent; (4) gypsite—gypsum sand—contaminated with clay, and (5) satin spar—fibrous with a silky lustre. Anhydrite, anhydrous $CaSO_4$ is usually found in varying quantities in all gypsum deposits.



White massive gypsum or alabaster. Photograph, courtesy New York State Museum, Albany, N. Y.

Lavoisier worked upon the chemistry of gypsum and it was from the plants near Paris mining and calcining gypsum that the name "Plaster of Paris" arose. The first recorded discovery of gypsum in the United States was in Onondaga County, New York, in 1792. Benjamin Franklin had introduced gypsum in 1760 after learning of its fertilizing value in France. Thousands of tons of land plaster (ground gypsum), at first imported from Nova Scotia and later quarried in New York State, were used annually in the colonies and in the early days of the republic. Until 1889 nearly two-thirds of the quarried gypsum was used as land plaster. Gradually the use of plaster of Paris gained a foothold in the building trade. In 1893 at the Chicago Columbian Exposition, the "staff" used on the outside of the Exposition buildings was a mixture of gypsum plaster and fibre. Today the largest outlet for gypsum is in the manufacture of wall plasters, wallboards and partition tile. Yet there are numerous industrial and chemical uses for this mineral, outside of the building field. No attempt is made here to cover the use of gypsum in the building construction field.

Three forms of gypsum are utilized—

1. Raw gypsum $CaSO_4\ 2H_2O$
2. "Plaster of Paris" or the hemihydrate of calcium sulfate ($CaSO_4\ \frac{1}{2}H_2O$)
3. Anhydrous calcium sulfate or anhydrite ($CaSO_4$)

Raw gypsum is obtainable in—

1. The crude, unsized, unselected form.
2. A graded, sized rock, made to screen specifications.
3. Land plaster, a coarsely ground gypsum without specification as to composition or color.
4. Terra Alba, a finely ground gypsum made to close specifications as to color, fineness, purity, and other physical characteristics.

Table 1.—Statistics on Gypsum and Gypsum Products in the United States, 1925-34

(Bureau of Mines—Mineral Yearbook 1935)

	1925-29 (Average)	1930	1931	1932	1933	1934
Crude gypsum:						
Mined—short tons	5,355,803	3,471,393	2,559,017	1,416,274	1,335,192	1,536,170
Imported—short tons	870,465	902,358	713,880	374,072	359,490	361,186
Sales by domestic plants:[1]						
Raw gypsum:						
Short tons	1,086,762	1,083,106	851,443	516,136	491,273	578,947
Gypsum products:						
For building purposes:						
Short tons	[2] 4,342,662	[2] 2,641,873	[3,4] 2,077,214	[3,4] 1,149,872	[3] 1,011,506	[3] 1,074,017
For manufacturing uses:						
Short tons	[2] 124,464	[2] 197,665	[4] 55,172	[4] 43,889	48,965	66,573
Total gypsum products sold:						
Short tons	4,467,126	2,839,538	2,132,386	1,193,761	1,060,471	1,140,590
Grand total sales:						
Short tons	5,553,888	3,922,644	2,983,829	1,709,897	1,551,744	1,719,537
Gypsum products imported:[5]						
Short tons	8,231	7,708	7,364	3,302	3,108	1,646

1. Gypsum and gypsum products produced from rock of both domestic and foreign origin.
2. Some gypsum products (from imported rock) for manufacturing uses included with those for building purposes.
3. Includes calcined gypsum sold to other manufacturers and for miscellaneous uses.
4. Revised figures.
5. Includes ground and calcined gypsum and Keene's cement, but not "manufactures of which plaster of Paris is the component material of chief value n.s.p.f." (principally statues, art goods, and novelties).

The map showing the gypsum deposits in the United States and the producing mills gives the extent of the gypsum industry. "Plaster of Paris" or the hemihydrate of calcium sulfate is made by heating the dihydrate ($CaSO_4$ $2H_2O$) to approximately 330° F. in a horizontal rotary calciner or a vertical kettle. Plaster for industrial and chemical uses can be made to specification as to purity, grind, color and physical characteristics. By the use of retarders or accelerators the setting time can be controlled within close limits. A plaster, known as Hydrocal, made by a special process under pressure offers the strongest and hardest material of the hemihydrate type. The characteristic of plaster to set to a hard mass in a short time from a fluid mix is well known and widely utilized. It is used for industrial moulds, models and patterns.

Anhydrous calcium sulfate found in nature is known as "anhydrite." It is an entirely different mineral from gypsum. Generally, it is very hard and less pure than corresponding deposits of gypsum. Anhydrous calcium sulfate, or so called "dead-burned gypsum," can be made by heating gypsum about 500° F. but unless it is heated to about 1800° F. it is not a stable material and will absorb sufficient moisture to form the dihydrate. The material fired at high temperature, however, is considered to be dead-burned and will only set or harden in the presence of certain catalysts, and then the product is known as "Keene's Cement." The use of natural anhydrite is limited. The dead-burned calcium sulfate is available in a finely ground, brilliantly white grade. It is used principally as a paper filler.

Chemical Uses of Gypsum

The most important chemical uses of gypsum, where it intimately enters into chemical reaction, are as follows:

Cement retarder: the addition of a small amount of gypsum to Portland cement retards the set. Raw gypsum is added in proportions of two to three per cent. to the burned cement clinker before it is ground. It is used as a source of sulfuric anhydrite (SO_3) and its value is directly proportional to the SO_3 content of the gypsum rock. Usually a rock of uniformly high SO_3 content and graded as to size is used. Roller (5) has made a recent study of the chemical reactions and the role of calcium sulfate in the setting of Portland Cement. Budnikoff reports (*Concrete*: July 1935, p.

Quarry at Alabaster, Michigan. One of the largest gypsum quarries in the world.

37) a much higher strength in early hardening period of clay-lime cements (so called glinite-cement) where dead-burned gypsum replaces part of slaked lime.

Land plaster or fertilizer: on soil deficient in sulfate sulfur, ground gypsum has definite fertilizing value. On black alkali soils, ground gypsum transforms the harmful sodium carbonate into calcium carbonate and sodium sulfate. It is used extensively in the Southwest for this purpose. It has proved to be of benefit on legumes such as alfalfa, clover, beans, peas, vetch, etc., particularly if the land is deficient in sulfur. It is estimated by Santmyers (7) that between 12,000 and 15,000 tons of land plaster are used annually on the peanut growing areas of Virginia and North Carolina. Ground gypsum is used extensively in Europe for the fixing of volatile nitrogen in manure. The volatile ammonium carbonate is changed into ammonium sulfate and the nitrogen retained. Finely ground gypsum is used for this purpose to a limited extent in this country.

Water treatment: it is customary to add calcium sulfate in small quantities to water used for brewing, particularly if the water is deficient in calcium sulfate. The presence of calcium sulfate favors enzyme action, improves the quality of the beer, assists in the development of the proper yeast and yeast fermentation, as well as helping the settling out of the yeast and the clarification of the liquid to give a beer of light color.

Calcium sulfide production: when ground gypsum is intimately mixed with coke or charcoal and burned under reducing conditions, calcium sulfide is formed. Its main outlets are medicine, luminous paint, preparation of arsenic free hydrogen sulfide, depilatory, as a base for calcium lithopone and as an insecticide and fungicide. Rossberg and Sheridan in U. S. Patent 1,492,810 disclose a method for the manufacture of calcium sulfide. In the manufacture of calcium base lithopones gypsum rock is reduced to the sulfide. A number of German patents have been issued on the manufacture of calcium sulfide.

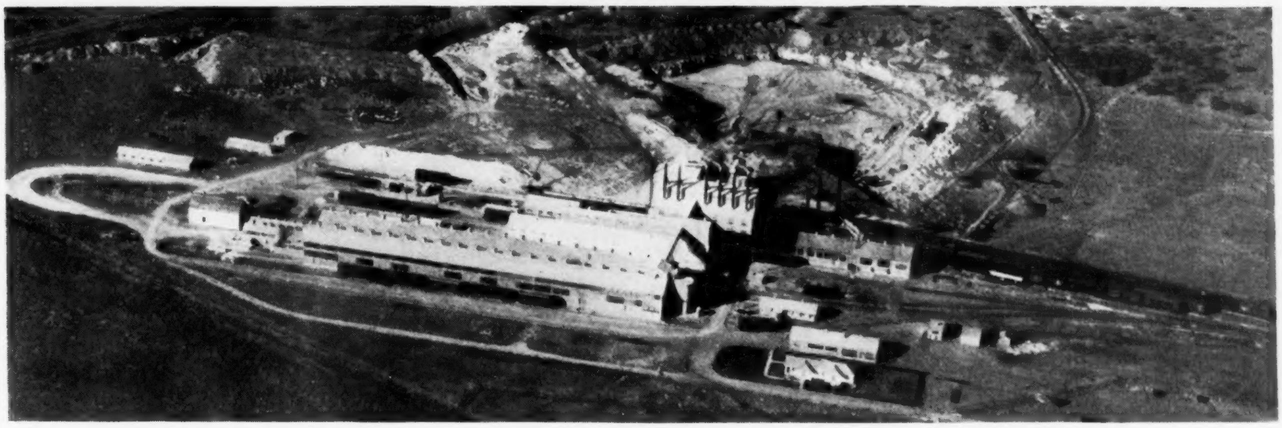
Table 2.—World Production of Gypsum, by Countries, in Metric Tons

(Compiled by the Bureau of Mines)

(Minerals Yearbook—1935)

Country[1]	1925	1930	1931	1932	1933	1934
Algeria	74,842	94,780	91,120	90,550	86,220	(2)
Argentina[3]	42,775	49,449	39,473	33,543	34,805	(2)
Australia:						
New South Wales	301	2,914	1,766	2,481	2,307	(2)
South Australia	73,436	41,482	24,596	45,684	51,373	(2)
Victoria	14,751	5,902	1,590	2,951	5,214	(2)
Western Australia	3,109	1,606	226	3,706	2,653	(2)
Austria[4]	60,000	37,350	48,000	36,000	45,000	(2)
Canada	640,335	997,942	800,931	398,883	336,283	(5)
Chile	8,446	17,178	13,173	11,989	13,682	(2)
China	67,000	62,100	71,500	(6)	(6)	(2)
Cuba	(2)	27,200	(6)	(6)	(6)	(2)
Cyprus[7]	24,510	10,452	9,934	10,995	12,881	(2)
Egypt[8]	....	130,000	130,000	130,000	130,000	(2)
Estonia	5,060	1,963	7,851	8,299	5,670	(2)
France	2,330,640	3,055,420	2,832,280	(6)	(6)	(2)
Germany[9]	58,289	705,000	[9] 490,000	398,500	485,000	810,000
Greece	10,060	1,365	3,200	2,167	(6)	(2)
India, British	36,826	57,220	54,493	52,246	33,674	(2)
Italy	673,532	685,530	587,845	529,821	534,026	(2)
Latvia[10]	12,355	35,272	31,431	36,812	48,251	82,800
Luxemburg	24,951	10,619	9,263	9,403	12,864	(2)
Morocco, French	....	167,270	70,400	(6)	(6)	(2)
New Caledonia	15,000	3,131	11,550	11,900	11,565	(2)
Palestine	....	1,661	491	1,481	2,602	(2)
Peru	14,644	14,412	8,603	(6)	(6)	(2)
Poland	....	40,000	24,000	(6)	(6)	(2)
Rumania	53,845	51,252	53,003	40,018	57,094	(2)
Spain	589,431	1,582,604	827,282	697,230	709,246	(2)
Sweden	128	135	50	115	49	(2)
Tunisia	11,600	20,000	17,450	26,000	17,580	(2)
Union of South Africa	7,237	17,098	14,847	7,113	11,809	(2)
United Kingdom:						
Great Britain	420,952	851,468	767,011	1,011,399	1,000,865	(2)
Northern Ireland	231	193	(6)	41	(6)	(2)
United States	5,151,242	3,149,178	2,321,489	1,284,815	1,211,259	1,393,583
Yugoslavia[11]	....	1,463	836	(6)	842	(2)
	10,700,000	11,900,000	9,400,000	7,600,000	7,600,000	(2)

1. In addition to the countries listed, gypsum is produced in Japan, Switzerland, and the U.S.S.R. (Russia), but production data are not available.
2. Data not available.
3. Rail and river shipments.
4. Estimate furnished by Bundesministerium for Handel und Verkehr.
5. Data for crude gypsum mined not available. Shipments of crude (lump, crushed, and ground) and calcined gypsum amounted to 418,386 tons.
6. Data not available; estimate included in world total.
7. Exports of crude and calcined gypsum.
8. Approximate production.
9. Figures supplied by Deutscher Gips-Verein. E. V. Berl'n, Germany. Figures are exclusive of rock gypsum mined and used by cement, paint, and other factories from their own quarries, which is estimated to have amounted to 1,000,000 tons in 1930.
10. Exports.
11. Serbia only.



Typical gypsum mill. United States Gypsum's plant at Sweetwater, Texas.

Glass: Gelstharp in U. S. Patent No. 1,488,915 discloses the use of gypsum as a substitute for salt cake in the glass batch. Gypsum is not used at this time to any extent in the glass industry but should the price of salt cake increase to make it economically feasible to use gypsum it could be used. It is claimed that the evolution of the combined water in the gypsum assists in clearing up the glass melt. Gypsum plaster is used for leveling up and holding the glass to the polishing table in the grinding and polishing of plate glass.

Neutral inert: while not strictly a chemical use, the fact that gypsum is practically a neutral material, makes it a particularly desirable inert for many chemical uses. As a diluent for rotenone type of insecticide, it is gaining wide recognition. It is used as an inert in wood fillers, paint, textiles and paper, for which uses a selected, white, finely ground product is required. It is used as a textile filler because of its needle-like crystalline structure and its splendid white color.

Drying agent: when dihydrate of calcium sulfate is heated above 145° centigrade and less than 400° centigrade, the product is an anhydrous gypsum known as soluble anhydrite. This material has the ability to revert to the hemi-hydrate and is an effective drying agent. Its production and use is covered by Hammond (Patent U. S. No. 1,887,349) (8). Hammond claims drying in the liquid or vapor phase with granular soluble anhydrite. Harvey uses the hemi-hydrate as a drying agent in ammonium salts (U. S. Patent 1,492,810). A free flowing, non-lumping ammonium sulfate is produced by addition of small per cent. of lime to neutralize the free acid and incorporating a small per cent. (1 to 10 per cent.) of the hemi-hydrate.

Source of lime and sulfur: no utilization of gypsum as source of lime and sulfur or sulfur dioxide in this country is known. However, in Germany it is used for the production of cement and sulfuric acid. Honus (*Zement*, Sept. 12, 1929) reports that the following practical methods are developed:

Map showing gypsum mills and deposits in the U. S. (Gypsum Ass'n and Michigan Geological Survey.)

"(a) The gypsum is reduced to calcium sulphide by means of powdered coal, the sulphide treated with steam, to generate hydrogen sulphide, leaving a residue of lime, and the sulphide gas burned with just suffcient air to form sulphur.

"(b) Another process involves the heating together of gypsum and calcium sulphide, a procedure which results in the formation of sulphur dioxide and lime. $3CaSO_4 + CaS = 4CaO + 4SO_2$. The quicklime formed is very pure.

"(c) The last procedure has been modified by the use of an aqueous solution of a sulphide or sulphhydrate which forms a more intimate mixture and secures an easier reaction.

"(d) Lime and sulphur dioxide can be obtained from gypsum by the simple, carefully regulated heating in the presence first of reducing and later of oxidizing gases. Calcium sulphide is first formed and this later is oxidized to lime and sulphur dioxide. $CaSO_4+4CO=CaS+4CO_2$ and $CaS+3O=SO_2+CaO$.

"(e) The electrolysis of anhydrite ($CaSO_4$) in the molten form in the presence of an excess of air produces sulphur trioxide and lime.

"(f) As an example of the many methods of preparing Portland Cement from gypsum, finely powdered burned gypsum and clay are mixed, pressed into bricks with the aid of a little water and burned. Sulphur dioxide and a true Portland Cement are formed."

A number of German patents on the reduction of gypsum to form sulfur, sulfur dioxide, etc., have been issued, principally to the Badische Anilin and Soda Fabrik.

In ammonium sulfate manufacture: Newland (1) reports that in Germany gypsum is employed in the manufacture of ammonium sulfate in connection with the Haber process. A considerable tonnage of gypsum is so used. It is claimed that anhydrite serves the purpose as well as or better than gypsum.

Potential Source of Sulfur

Though it contains only 18.5 per cent. sulfur, because it is found in vast deposits throughout the world, gypsum can be considered one of the world's great potential sources of sulfur. In the United States the chemical utilization of gypsum has been small, largely because of the great deposits of pure sulfur available in Louisiana and Texas. While iron pyrites contains about twice as much sulfur as gypsum the deposits are not nearly so extensive. Germany demonstrated to the world some of the chemical possibilities of gypsum. At some future date should the supply of pure sulfur fail, then gypsum, as a chemical raw material, will receive a great deal of consideration.

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Bentonite for Stopping Water Seepage

Bentonite of the type occurring chiefly in the Black Hills of Wyoming and South Dakota has the distinctive property of absorbing nearly five times its weight in water and swelling enormously in the process, the U. S. Bureau of Mines reports. The increase in volume at full saturation may be as high as 15 times its dry bulk. When dried it shrinks but reswells when wetted. Drying and reswelling may be repeated any number of times.

Because of this property bentonite is being utilized advantageously by the U. S. Forest Service and by other organizations, both private and public, to prevent water seepage.

Chlorinated Rubber in Paints

Three main stumbling blocks to the scope of chlorinated rubber finishes are represented by sensitivity to high temperatures, solubility in organic solvents and breakdown on exposure to ultra-violet rays, points out an article in a recent issue of *Paint Manufacture* (London). In these three respects chlorinated rubber behaves somewhat like rubber itself. Photo-chemical decomposition is automatically eliminated, according to the article, by the incorporation of pigments which (with the exception of whites) insures retention of the excellent initial gloss of chlorinated rubber coatings for a period of years.

Dr. Schultze, noted German bio-chemist, discussing the chlorinated rubber question before the recent Berlin Corrosion Conference, stated that heat-sensitivity will always remain an inseparable difficulty with chlorinated rubber. In this connection, exposure to warm liquids may have disastrous results, and chlorinated rubber paints, according to Dr. Schultze, are not likely to prove particularly efficient when exposed to warm liquids at temperatures exceeding 60° to 65° C. The considerably higher limit of 105° C. has been found permissible, however, where dry heat is concerned.

Apart from their unquestioned anti-rusting value on ferrous metals, chlorinated rubber paints also provide satisfactory protection on aluminum and its alloys, as well as on other metals. Indispensable for successful results, however, is the thorough degreasing and drying of the iron surfaces since fats react unfavorably upon the drying and adhesive qualities. Special primers have been developed, since drying oils do not give the best results when the coated structure is constantly exposed to water or a high degree of humidity.

In place of the usual red lead-linseed oil primers, chlorinated rubber-red lead primers containing certain synthetic, unsaponifiable plasticizers have been successfully employed. These special priming compositions require a surprisingly short interval for attaining the dust-dry stage. It is asserted that a red lead-chlorinated rubber primer is sufficiently hard and water-repellent within thirty minutes after application to be resistant to the action of rain. Under acidic conditions the chlorinated rubber primers have shown good durability over a period of years, while their hardness and adhesive strength result in a considerable reduction in damage during transport and assembly of constructional materials.

Unsaponifiable plasticizers must again be incorporated if the finishing coat is likely to be exposed to water, salt solutions, alkaline liquors, waste liquors from technical processes, etc. Under these conditions, the article concludes, the pigment content should not exceed 50% and should be of maximum fineness. Ordinary chlorinated rubber paints dry with extraordinary rapidity to a tack-free condition, but thorough drying takes a considerable time owing to the remarkable obstinacy with which the last traces of solvent are retained.

Hydrogen Peroxide for Bleaching Cotton Goods

By R. E. Rupp

WHEN promoters of peroxide as a bleaching agent for cotton first began an intensive campaign for its use on cotton piece goods they advocated a single boil in which removal of the dirt and natural impurities was carried out simultaneously with the cellulose bleaching. This procedure was a mistake for the chief obstacle to hydrogen peroxide was cost. It is generally accepted that the most economical removal of the natural waxes and other foreign matter in cotton can be best accomplished with a strongly alkaline solution and at pressures greater than atmospheric. Neither of these conditions is suitable for hydrogen peroxide bleaching, so lower temperatures and less alkali were used. This resulted in an incomplete removal of the foreign matter and required a large amount of peroxide to obtain a satisfactory white. The net result was poorer quality and greater expense.

This method found little favor, although the simplicity of putting gray cloth in a kier and in one operation completing the bleach still has an appeal to the cotton bleacher. So the possible advantages of a single boil were discarded for the sake of economy and the two-boil scheme adopted; that is, a preliminary boil with caustic under pressure, followed by the peroxide bleaching, in which manner much smaller amounts of peroxide are required. By this method, whatever means the bleacher deems best may be used for the boil-out, or removal of waxes, size and foreign matter. It is evident that the more thorough and complete this preliminary boil-out is, the better and more economical will be the subsequent peroxide bleach.

The equipment generally used is the kier. The kiers in which peroxide bleaching is being done most successfully are almost always cement- or silica-lined vessels, for continuous applications of lime harm the goods. Cement and silica have built up a lining on both the iron walls and the circulation pipes that effectively keeps the kier liquors from much actual contact with the iron. Cement-lined pipes have been used to advantage in the circulation systems when replacing old sections of iron piping.

There has been considerable discussion about loading and charging kiers for bleaching. In the ordinary five-ton kiers the average load is 8,500 to 9,500 pounds of cloth. If the bleaching is preparatory to dyeing with colors which are likely to show rub marks, it is often advisable to have the kier lined with cloth; if not for this class of work, lining is less important. Again, a kier with a short load is more likely to produce rub marks than one loaded to capacity and chained firmly in place.

Top and Bottom Charging

The charges are usually introduced from the bottom of the kier and by so doing, the air is more readily displaced from the cloth than by filling from the top It has been pointed out, however, that bottom filling has an upward packing effect upon the cloth against the chains, and might have an effect in the direction of poorer circulation. Actually, the point of top or bottom filling is probably of little significance with the bottom method having the preference, if any.

The volume of liquor should be sufficient to cover the cloth completely, so that during the boils, both preliminary and bleaching, the fabric is entirely immersed at all times. This may be of minor importance, for successful kier boiling has been done, and is perhaps being done, where the kier liquors are short and insufficient to cover the cloth. Nevertheless, the possible dangers of resists, uneven work, and tender cloth from this practice would seem to more than offset the almost negligible increase in cost due to filling the kier completely.

The time of boiling before bleaching is usually six to ten hours, and this is no doubt much longer than is actually required, for it can be readily demonstrated that a boil for one hour at 15 to 20 lb. pressure removes the waxes, etc., as completely as a six- or ten-hour boil at the same pressure, if the cloth is intimately and evenly in contact with the liquor. The boiling is usually done in the late afternoons and nights, and the cloth will not be moved from the kier until the following morning in any event. The heat economies offered are small, for much more heat is required in bringing the kier to pressure than for maintaining this temperature. Shortening the boil by three or four hours would show a comparatively small economy in heat. Furthermore, this extra time is a good and not very costly insurance against the possibility that the kier may have been loaded so that the circulation is poor or uneven.

Mechanical phases of loading and boiling can be summed up in two warnings: beware of rubbing the fabric unnecessarily; and do everything possible to assist even and complete circulation throughout the kier.

Charge for the boil-off preliminary to peroxide bleaching is a complete problem within itself and one about which many experimental tests, both scientific and not, have been made. As stated previously, the better the results obtained in this process, the better and more economical will be the subsequent bleaching.

Essential requirements for a good preliminary boil out are:

1. A good soft-water supply.
2. A thorough removal of the acid-soluble minerals before the boil.
3. An alkali of sufficient concentration and causticity completely to saponify the saponifiable material, and to hydrolize as completely as possible the protein, starch and sugar-like components.
4. An emulsifying detergent.

While perhaps not as yet completely adopted throughout the industry, the advantage of a grey sour before loading the cloth into the kier is without question to any one who has experimentally studied the problem. By this sour, ten to twenty pounds of calcium, magnesium, iron, etc., or their salts are removed and instead of having metallic soaps or other organic-metallic deposits to emulsify the corresponding organic acids that are present, which not only readily combine with sodium, but in so doing form sodium compounds which have some detergent value in themselves.

The most effective and economical alkalies are the hydroxides. Potassium is so much more costly, and has never been proved of exceptional superiority, that it is not considered seriously for kier boiling. Of the sodium alkalies, sodium hydroxide is very superior on an equal value basis to any of the others. Statements have been frequently made that the milder alkalies produce a softer fabric. This is true, but true because the mild alkali did not so completely remove the natural cotton waxes and oils as does caustic soda and this fatty matter softens the fabric as well or better than later additions of oil emulsions.

Earlier claims were also made that peroxide bleaching gave a softer hand. This too had its foundation in the fact that the earlier experiments with a one-boil peroxide bleach could not use enough alkali to remove the natural oils and waxes thoroughly and the presence of these caused a softer fabric than one in which they had been completely removed. There has been no convincing scientific evidence offered to show that the cellulose of the fibre is changed by solutions of alkali of low concentrations, such as are generally used in kier boiling. The differences in the softness or harshness, obtained by differ-

ent bleaching materials or processes, unless the fibre is actually changed, are invariably due to differences in the amounts of oil or wax left in the fabric or to differences in the mechanical drying and moisture content.

Desirable as this softer feel may be from the point of view of the starcher, it is undesirable if the goods are to be dyed or printed, in which cases the greater and more uniform absorbency resulting from a complete removal of these fatty materials is more important than the softer feel. Any degree of removal of these foreign substances in cotton cellulose can be secured more economically with caustic soda than with the milder alkalies, but for hydrogen peroxide bleaching it is questionable economy to cut down the caustic soda in the first boil and then be compelled to use larger amounts of peroxide because so much oxidizable organic matter had been left from the first boil.

Normally unsized cotton contains materials which at the temperature and pressure of the kier boil will react with approximately 2.0% of caustic soda on the weight of the cotton boiled. Increasing the caustic up to 4% of the weight of the fibre boiled will show marked improvements in the results obtained. Amounts beyond this (340 lb. NaOH for 8,500 lb. cloth in a five-ton kier) are of doubtful value. With this amount of caustic, additions of the milder alkalies such as borates, phosphates, carbonates or silicates, produce very little if any improvement in the quality of the results obtained. This statement will no doubt be met with many contradictions, but it should be kept in mind that the above statements were prefaced as applying to cotton which had been completely soured, and to the use of soft water. If these two conditions are not maintained in the bleach house, then some of the above, especially sodium silicate, may be well worth using. It is stated generally that the use of silicates helps to keep the protective coating on the kier walls and this function along with the possibility of an imperfect sour may justify its use. The poorer the water supply, the greater the possibility that the silicates or phosphates may be of some value.

The value of soaps, oils and kier assistants is a problem to which the mill chemist could devote a lifetime, and then not be able to investigate all the products offered. The problem may be simplified greatly by dismissing at once all the various mixtures and considering only the legitimate chemicals. By so doing the chances of overlooking anything of value are extremely remote. The author's individual experimental observations have been that the water-insoluble solvents such as the hydrocarbons and the halogenated or hydrogenated hydrocarbons are hindrances rather than assistants in producing a good quality boil and complete removal of the foreign matter from cotton cellulose. Further mixing them with soaps or sulfonated oils and silicates or carbonates, does not enhance their value in any way. As wetting agents such mixtures are of value, but not as kier-boiling assistants.

Soaps will improve the results obtained and help by assisting in the emulsification of the unsaponifiable matter. At the temperature and pressure of the kier boil most of the experimental work published indicates that the longer chain saturated fatty-acid soaps are most effective. The quantities required to give the maximum results are quite small.

After the regular pressure kier boil the liquor is drawn off and usually clean water added as the kier liquor is removed. This kier liquor is strongly reducing and the more completely it is removed from the cloth, the less peroxide will be consumed. The actual bleaching can be carried out in the same kier after washing, or the cloth may be pulled into another kier through a regular rope washer. The important thing is to secure a good washing, and whether done in the kier or in a rope washer is immaterial if equal results are obtained.

The time, temperature and concentration required for peroxide bleaching are inter-dependent as well as being governed by the quality of the cloth and the results obtained in the first boil. The usual procedure is to use ½ to 1% of 100 vol. hydrogen peroxide on the weight of the cloth and to have the solution made alkaline with silicate of soda and sometimes soda ash or caustic soda. Six hours at 180 to 200° are the usual time and temperature conditions.

Hydrogen peroxide is an oxidizing agent that becomes more vigorous and rapid in its action as the alkalinity of the solution is increased until at high alkalinities the peroxide decomposes with rapid evolution of oxygen. The alkalinity usually recommended is that obtained in a 0.2 to 0.3% solution of ordinary liquid silicate of soda. Sometimes further additions of alkali up to 0.1% caustic soda are made. Whether this is desirable depends in a great measure on the other conditions of the bleach. Silicate is almost universally used, for as well as fixing the alkalinity, it reduces the hazards of tendering from metallic deposits. At the alkalinity obtained by sodium silicate alone, it is satisfactory and probably more efficient to carry out the bleach at 210 to 212° F. than at 180 to 200° F. While cellulose is not readily attacked by hydrogen peroxide, production of oxycellulose with the usual strength losses may occur if the alkalinity is too great at these higher temperatures. This is especially true if excesses of peroxide beyond that necessary to destroy the coloring matter are used.

The amount of peroxide that is necessary varies with the natural color of the fabric and the quality of white demanded, as well as with the results obtained in the first boil. On average piece goods a white satisfactory for most purposes can be obtained with forty to fifty pounds of 100 vol. peroxide per 9,000 lbs. kier of cloth. For dark dye shades or other lines less severe in the white requirements, the amount can be reduced. With these amounts of peroxide the cases of tendering are very infrequent. Weak fabrics are encountered principally when larger amounts of peroxide are used in attempting to bleach very dark fabrics to a good white, or when the preliminary boil is poor and when quantities double or treble the above are used. Such amounts may produce strength losses, especially if high temperatures and high alkalinities are used. In practice it is well worth while to make regular or at least intermittent checks on the bleaching liquors, testing both the alkalinity and peroxide concentration as the bleaching progresses. Rapid loss of peroxide should be a danger warning that the peroxide is decomposing and may result in tender cloth or poor bleaching. Such a condition may be caused by alkalinities or temperatures that are too high or may be due to some catalytic decomposition. A kier liquor which shows considerable peroxide after the bleaching is accomplished is wasteful and experiments with reduced amounts should be tried, and the temperature of alkalinity increased to speed up the rate of bleaching.

Decomposition of hydrogen peroxide and the accompanying destruction of the cotton fibre in the intimate presence of iron or iron compounds has never been completely explained. A real contribution to the science of hydrogen peroxide bleaching will be made by the investigator who clearly explains under what conditions iron is a menace and when not. It may be possible that iron itself is not responsible for the cases of tendering, but that an impurity in the iron, an alloyed metal for example, may cause the peroxide decomposition and fibre strength losses.

Quality claims for one oxidizing agent over another are without much foundation of fact. If two methods are compared, and one is handled expertly, the other poorly, the quality produced by the first will undoubtedly be superior, but in the next mill the expertness with which the processes are handled may be reversed and therefore the qualities are reversed. To compare any materials or processes both must be tested at the conditions most favorable to that particular material or process in order to get reliable results. It is no doubt violations of this rule which have led to conflicting claims of superior quality for one or another oxidizing agent. There are a number of different oxidizing chemicals that will give equally good white bleaching without destruction of the cotton fibre, and differences of quality are due to the skill of the manipulator in the application of the different materials. Abstracted from *Cotton*.


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Miscellaneous

An aluminum compound, patented by R. H. Carter, U. S. Dept. Agriculture, U. S. P. 2,046,546, is said to eliminate the health risks contracted by fruit sprayed or dusted with fluorine-containing insecticides. Compound is added to acid bath and aluminum sulfide and aluminum chloride are suggested.

Use of Casein in Japanese Silk Industry

Production of casein as a by-product of the Japanese raw silk industry is still in the experimental stage, according to Tokyo reports. Government organizations as well as silk filatures are working on the problem with the view to producing casein at a cost low enough to compete with the imported product.

Whale Oil for Varnish Manufacture

A treated whale oil for use in manufacturing varnishes, said to resemble linseed oil both in consistency and color, has been introduced in Germany, according to a report from Frankfort-on-Main. New product hardens without drier in 36 hours and produces a firm film. In addition a special variety of "blown whale oil" is being offered as a plasticizer for nitrocellulose lacquers and as a substitute for tung oil in four-hour varnishes.

Diphenyl Compounds in Solar-Heat Engine

Arochlor, a chlorinated diphenyl compound, manufactured as a heat-transfer agent, has been successfully used by Dr. C. C. Abbott in constructing a steam engine run by the sun. He claims it could take over the task of providing power for the world in the event of the exhaustion of coal and oil supplies.

Dry Ice for Leprosy Treatment

Dry Ice for the treatment of leprosy has been found efficacious by Dr. Paldrock, University of Tartu, Esthonia, who has recorded destruction of the malignant tissue at the low temperature produced. Treatment is rendered more effective by gold injections.

Tellurium Uses

Tellurium-lead represents the main field for tellurium at present, but several minor outlets have aroused interest (*Giorn. dei Chim.*, April, 1936, p. 130). The element and its compounds exercise a marked bactericidal action and numerous preparations on the basis of colloidal tellurium have in fact been introduced into medicine. Diethyl tellurium resembles tetraethyl lead in functioning as an anti-knock agent in petrol. Tellurium has also been examined as an ingredient of photo-sensitive preparations in conjunction with ferric chloride and tartaric acid. Under the action of light the ferric salt is reduced to the ferrous salt which in presence of hydrochloric acid reduces tellurium anhydride to form a brownish-black deposit of tellurium metal.

Fireproofing with Salts

Walls and floors of lumber treated with incombustible salts have been found to stop fires, confining the flames to the original point. The fire-proof qualities endure throughout the lifetime of the wood, and paint and varnish may be used on woods so treated. Fire-proofed floors subjected to intense heat come out blackened and charred on the exposed surface, but unharmed otherwise.

Selenium in Phosphate Rock

The authors of a contribution to the U. S. D. A. Bureau of Chemistry and Soils report upon the selenium contents of 96 samples of phosphate rock and 3 samples of apatite from various deposits of the world, 8 representative samples of commercial superphosphates manufactured from domestic rock, and 4 samples of crude phosphoric acid produced by the sulfuric-acid process. The data indicate (1) that organic matter and, to a less extent, inorganic sulfides are important carriers of selenium in phosphate rock, (2) that primary deposits are in general richer in this element than are secondary deposits, (3) that deposits belonging to the Permian and Cretaceous ages contain the most selenium, and (4) that the selenium content of phosphate deposits is about the same as that of other sedimentary deposits in the same region.

"The quantity of selenium in superphosphate ranges from <0.8 to 4.0 p. p. m., and in phosphoric acid is 0.5 p. p. m. or less. According to the available data, only a small fraction of the selenium occurring in the natural materials from which superphosphate and phosphoric acid are made finds its way into the finished product." L. F. Rader, Jr., and W. L. Hill (*Jour. Agr. Res.* [*U. S.*], *51* (1935), No. 12, pp. 1071-1083).

Pectin in Photography

Pectin is being used to replace gum arabic in gum-bichromate photographic print process in Germany, according to information received by the Department of Commerce from the consular clerk at Frankfort-on-Main. Pectin sensitized with bichromate of potash not only is more sensitive than sensitized gum arabic to light, but also produces good pictures with black and red pigments.

New Glass Lime

Calcimag is a dead-burned dolomitic lime, free-flowing, with a density approximating that of sand. Manufacturer, Basic Dolomite, Inc., 845 Hanna Bldg., Cleveland, Ohio, claims it eliminates losses from air slaking and the hazard to workmen resulting from the use of free lime. The raw deposit typically and uniformly analyzes 55% calcium carbonate and 44% magnesium carbonate. Total impurities in the raw material run less than 1%.

German Carbon Black

A carbon black comparable with the American product has been perfected in Germany according to the American Consul at Frankfort-on-Main, made public by the Commerce Department's Chemical Division. The German product, which is based upon naphthalene, a derivative of coal tar, as a raw material, is now in commercial production and is rapidly displacing American carbon black which formerly supplied practically all of that country's requirements for high grade black pigments.

Highly Polished Copper Surfaces

Highly polished surfaces have been produced upon copper and some of its alloys by a method based upon anodic treatment of the metal in a concentrated aqueous solution of orthophosphoric or pyrophosphoric acid. The metal under treatment forms the anode and is immersed in the acid solution which is kept at a low temperature (15° to 25° C.) while the cathode is formed by a copper sheet with a larger surface area than that of the anode. Best results (*L'Industrie Chimique*, June, 1936) are obtained with a voltage in the vicinity of that required for gaseous evolution; if gas is evolved at 2.1 volts, for example, the optimum operating voltage is 1.9.

New Use for Calcium Cyanide

Calcium cyanide applied at the rate of 1 lb. per 15 sq. ft. is recommended as a control for the iris borer by E. I. MacDaniel, Dept. Entomology, Michigan Agricultural College. The control is said to be perfect in killing both larvae and pupea of the iris borer as well as the larvae of the lesser bulb fly. There is no injury to the plant if the roots are covered with dry sand but where the cyanide comes in direct contact best results are obtained by sprinkling with cyanide, with a light covering of sand afterwards, as soon as it is applied. The proper time of application is during May and June.

U. S. Chemical Patents

A Complete Check-List of Products, Chemicals, Process Industries

Agricultural Chemicals

Process of making ammonium phosphate from ammonia and phosphoric acid in the presence of an inert gas to maintain the partial pressure of the ammonia in the gaseous mixture greater than that of the vapor pressure of the ammonia above the ammonium salt. No 2,051,029. Harry A. Curtis, Knoxville, Tenn., to Tenn. Valley Authority, Wilson Dam, Ala.

Cellulose and Derivatives

Production of an unsaturated cellulose ether in which the ether group contains an olefinic double bond of at least 3 carbon atoms in length. No. 2,047,952. Deane C. Ellsworth, Gordon Heights, Del., to du Pont.

Production of a composition consisting of a cellulose derivative and an ether of a six carbon atom, aliphatic hexahydric alcohol. No. 2,047,972. Walter E. Lawson, Wilmington, to du Pont.

Production of artificial filaments and yarn from solutions of cellulose derivatives. No. 2,048,248. Camille Dreyfus, N. Y City, N. Y., and George Schneider, Montclair, N. J., to Celanese Corp. of America.

Production of a mixed organic acid ester of cellulose by acylating cellulose or a cellulose compound containing esterifiable hydroxyl groups with a 2-3 carbon fatty acid, an organic acid anhydride, and glacial acetic acid. No. 2,048,685. Hans T. Clarke, N. Y. City, and Carl J. Malm, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Impregnation of cellulose acetate materials with a diazotizable amine and an enolic coupling component. No 2,048,796. Ernest W. Kirk and George H. Ellis, Spondon, England, to Celanese Corp. of America.

Method of saponifying cellulose ester fabrics with an agent consisting of an alkaline earth metallic compound and an alkaline alkali metallic substance. No. 2,049,430. Henry Dreyfus, London, England.

A cellulose acetate composition containing also a dimethyl tetrahydronaphthalenedicarboxylate as plasticizer. No. 2,049,565. Harold S. Holt, Wilmington, Del., to du Pont.

Preparation of acid amidines from aliphatic nitriles containing at least 4 carbon atoms and an alkali metal amide. No. 2,049,582. Karl Ziegler, Heidelberg, Germany, to Rohm and Haas Co., Philadelphia.

Preparation of 3-hydroxydiphenyleneoxide-2-carboxylic acid No. 2,050,-958. Friedrich Muth, Leverkusen-I.G.-Werk, Germany, to General Aniline Works, N. Y. City.

Production of a new cellulose derivative from a soluble cellulose xanthate. No. 2,051,051. Leon Lilienfeld, Vienna, Austria.

Process of preparing a mixed fatty acid ester of cellulose by treating the halide of a fatty acid with the salt of a different fatty acid in the presence of an acylation catalyst. No. 2,051,217. William O. Kenyon and George P. Waugh, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Method of drying cellulose preparatory to its esterification by treating with an aqueous solution of an aliphatic polyhydroxy alcohol and then subjecting to an elevated temperature. No. 2 051,220. Carl J. Malm, Rochester, N. Y., and Charles L. Fletcher, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.

Preparation of high viscosity aralkyl ethers of cellulose by impregnating cellulose with an aqueous alkali solution and subsequent treatment with an aralkyl halide. No 2,051,492. Eugene J. Lorand, Wilmington, Del., to Hercules Powder Co., Wilmington, Del.

Cellulose organic ester composition containing phenyl propionate. No. 2,051,535. Henry B. Smith, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Preparation of a cellulose ester composition containing phenyl cyclohexane. No. 2,051,536. Henry B. Smith, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Coal Tar Chemicals

Process for the preparation of phthalaldehydric acid by the chlorination of phthalide and subsequent hydrolysis. No. 2,047,946. Paul R. Austin and Euclid W. Bousquet, Wilmington, Del., to du Pont.

Production of nitrated ortho-alkyl phenols. No. 2,048,168. John D. Pollard, Baltimore, Md., to Veador Leonard, Baltimore.

Process for refining hydrocarbons by contacting with an addition compound of an alkali metal and a polycyclic aromatic hydrocarbon. No. 2,048,169. Norman D. Scott, Niagara Falls, to du Pont.

An apparatus for the dry cooling and the discharge of coke. No. 2,048,193. Arnold Moettelli, Winterthur, Switzerland, to Sulzer Frères, Société Anonyme, Winterthur, Switzerland.

Process for condensing naphthalene sulfonic acids with amino salicylic acids in the presence of an alkali bisulfite. No. 2,048,283. Franz Neitzel, Basel, Switzerland, to Durand and Huguenin S. A., Basel.

Production of an aroyl chloride of the benzene series by the reaction between chlorine, carboxylic acid of the benzene series, and phosphorus trichloride, in the presence of phosphorus oxychloride. No. 2,048,768. Harold W. Anderson, Wilmington, Del., to du Pont.

Improved batch-type process of making primary nitro-aryl amines of the benzene series. No. 2,048,790. William L. Foohey and Ferdinand W. Peck, Pennsgrove, N. J., to du Pont.

Production of anthraquinone derivatives. No. 2,049,189. Earl Edson Beard, Arden, Del., to du Pont.

Production of 1:9 anthraselenazolecarboxylic acid. No. 2,049,212. Ralph N. Lulek, Wilmington, Del., to du Pont.

Production of anthraselenazole derivatives. No. 2,049,213. Ralph N. Lulek, Wilmington, Del., to du Pont.

Production of azo-anthranilic acid. No. 2,049,510. Mordecai Mendoza and Francis L. Rose, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., England.

Preparation of N-cyclohexyl ammonium benzothiazyl mono sulfide for use as a vulcanization accelerator. No. 2,050,195. Lorin B. Sebrell, Silver Lake, Ohio, to Wingfoot Corp., Wilmington, Del.

N-cyclohexyl ammonium benzothiazyl mono sulfide as a vulcanization accelerator. No. 2,050,199. Lorin B. Sebrell, Silver Lake, Ohio, to Wingfoot Corp., Wilmington, Del.

1-mercaptobenzothiazole and pentamethylene diamino disulfide used in accelerating the vulcanization of rubber. No. 2,050,203. Jan Teppema, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

Heterocyclic compound for use as vulcanization accelerator. No. 2,050,-208. Howard I. Cramer, Cuyahoga Falls, Ohio, by mesne assignment to Wingfoot Corp., Wilmington, Del.

Process of preparing 1,4,5,8,-napthalene-tetra-carboxylic acid. No. 2,050,657. Heinrich Greune, Frankfort, Germany, to General Aniline Works, N. Y. City.

Preparation of N-substitution products of 1,4-diaminoanthraquinones. No. 2,050,660; 2,050,661; and 2,050,662. Karl Koeberle, Christian Steigerwald, and Robert Schweizer, Ludwigshafen, Germany, to General Aniline Works, N. Y. City.

Method of producing N-substitution products of 1,4-diaminoanthraquinones. No. 2,050,704. Karl Koeberle, Robert Schweizer, and Christian Steigerwald, Ludwigshafen, Germany, to General Aniline Works, N. Y. City.

Treatment with aqueous ferric chloride solution in purification of phenylphenols. No. 2,050,815. Wesley C. Stoesser, Midland, Mich., to Dow Chemical Co., Midland, Mich.

Process of producing N-substitution products of 1,4-diaminoanthraquinone. No. 2,051,004 and 2,051,005. Karl Koeberle, Robert Schweizer, and Christian Steigerwald, Ludwigshafen, Germany, to General Aniline Works, N. Y. City.

Preparation of violanthrone derivatives. No. 2,051,045. Fletcher B. Holmes, Wilmington, Del., and Alexander J. Wuertz and William H. Lycan, S. Milwaukee, Wis., to du Pont

Production of an acid chloride of a carboxylic acid by heating a corresponding acid anhydride and an alkyl hydrocarbon having a polychlor substituted carbon atom. No. 2,050,096. Joseph R. Mares, St. Louis, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Preparation of violanthrone derivatives. No. 2,051,119 and 2,051,120. Alexander J. Wuertz and William H. Lycan, S. Milwaukee, Wis., to du Pont.

Production of compounds of the violanthrone series. No. 2,051,121 and 2,051,122. Alexander J. Wuertz, S. Milwaukee, Wis., to du Pont.

Production of a mixture of secondary and tertiary aromatic amines by the reaction between aniline preheated to 250° C and compressed or liquefied hydrochloric acid in a heat insulated, pressure tight vessel. No. 2,051,123. Hans Aickelin, Summit, N. J., to General Aniline Works, N. Y. City.

Method of preparing water soluble diazoamino compounds. No. 2,051,-148. Wilhelm Neelmeier, Wilhelm Meiser, and Otto Goll, Leverkusen-I.G.-Werk, and Heinrich Morschel, Cologne, Germany, to General Aniline Works, N. Y. City.

Production of chlorinated aryl-thiazoles. No. 2,051,145. Herbert A. Lubs and John E. Cole, Wilmington, Del., to du Pont.

Method of dehydrating phenols and mixtures containing phenols. No. 2,051,782. Kurt Buchheim and Curt Rath, Radebeul, near Dresden, Germany, to Chemische Fabrik von Heyden, A. G., Radebeul, near Dresden, Germany.

Coatings

Process of forming a flexible sheet material from a prolamine and glycerol, treated with formaldehyde, and subsequently with a phenol-formaldehyde type of resin and plasticizer. No. 2,047,961. Donald W. Hansen, Decatur, Ill, to Prolamine Products, Dover, Del.

Production of a new wrinkle finish enamel containing small amounts of phenol formaldehyde and a relatively large amount of the glycerine ester of abietic acid. No. 2,048,632. Charles R. Bragdon, Cincinnati, to Ault and Wiborg Corp.

An electrical arc-resistant insulating material consisting of asbestos board containing carnauba and paraffin wax. No. 2,049,370. Frank J. Groten, Pittsfield, Mass., to General Electric, Schenectady.

Preparation of a cathode surface by coating with reduced alkaline earth metal carbonate and nickel carbonate. No. 2,049,372. Shigenori Hamada and Kiyoshi Nomura, Tokyo, Japan, to General Electric, Schenectady.

Apparatus for making artificial leather. No. 2,049,892. John B. Catlin, Appleton, and Rudolf A. Moravek, Neenah, Wis., to Paper Patents Co., Neenah, Wis.

Production of colored lacquers and coating compositions containing a triaryl methane dyestuff, chromium, and a cellulose derivative. No. 2,050,921. Achille Conzetti, Basel, Switzerland, to J. R. Geigy, S. A., Basel, Switzerland.

Process for the production of the explanatory titles for the pictures on cinematographic films, using a protective coating impervious to silver solvents and a compound soluble in this coating. No. 2,051,603. Rudolf Hruska, Budapest, Hungary.

Dyes, Stains, etc.

Formation of a stabilized nitrosamine dye composition from a non-coupling organic sulfonate, a primary nitrosamine, and a coupling component. No. 2,048,745. Jean G. Kern, Hamburg, N. Y., to National Aniline and Chemical Co., N. Y. City.

Patents digested include issues of the "Patent Gazette," July 21 through August 18 inclusive.

Preparation of an alkali insoluble azo dye. No. 2,048,844. Miles A. Dahlen and Robert E. Etzelmiller, Wilmington, Del., to du Pont.
Production of chromiferous dyestuffs from azo-dyestuffs and a chromium compound. No. 2,048,898. Fritz Straub, Basel, Switzerland, Ernst Brunner, Manchester, England, and Willi Widmer, Basel, to "Society of Chemical Industry in Basle," Basel, Switzerland.
Fast brown and olive-green dyes obtained from water insoluble azo-dyestuff derivatives. No. 2,049,007. Oskar Haller, Offenbach, and Heinrich Morschel, Cologne-Deutz, Germany, to General Aniline Works, Inc., N. Y. City.
Process for dyeing cellulose acetate materials. No. 2,049,087. Robert L. Sibley, Nitro, W. Va., by mesne assignment to Monsanto Chemical, St. Louis.
Production of dyes of the 1:9 anthrathiophene series. No. 2,049,214. Ralph N. Lulek, Wilmington, Del., to du Pont.
Production of water insoluble dyes from an arylide of beta-hydroxy naphthoic acid and a diazotized amine. No. 2,049,216. Eugene A. Markush, Jersey City, Mark S. Mayzner, Asbury Park, and Julius Miller, Newark, N. J., to Pharma Chemical Corp., N. Y. City.
Production of azo dye derivatives of picramic acid and amino salicylic acid. No. 2,049,286. Crayton K. Black, Wilmington, Del., to du Pont.
Production of azo dyestuffs. No. 2,049,299. Arthur H. Knight, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd.
Preparation of anthraquinone dyestuffs. No. 2,049,648. Norman H. Haddock, Frank Lodge, and Colin H. Lumsden, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., England.
Application of water insoluble dyestuffs in printing of cellulose ester material in presence of an ether of polyhydroxy alcohol. No. 2,049,657. Simon T. McQueen and Alexander Stewart, Blackley, Manchester, England, to Imperial Chemical Industries, Ltd., England.
Production of azo dyestuffs and their intermediates. No. 2,049,674. Carl Taube, Leverkusen-I.G.-Werk, and Ernst Tietze, Cologne, Germany, to General Aniline Works, N. Y. City.
Method of dyeing porous material by impregnation process in water soluble dye. No. 2,050,260. William C. Black, Denver, Colo.
Preparation of primary disazo compounds to be used to dye leather. No. 2,050,811. Robert Schuloff, Vienna, Austria, to German I. G., Frankfort, Germany.
Process of making azo dyestuffs. No. 2,050,913. Walter Anderau, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.
Preparation of copper-containing azo dyestuffs. No. 2,051,133. Detlef Delfs, Rudolf Knoche, and Ernst Messmer, Leverkusen-I.G.-Werk, and Heinrich Clingestein, Cologne, Germany, to General Aniline Works, N. Y. City.

Explosives

Production of an explosive compound containing a metallic salt of a higher aliphatic acid. No. 2,048,050. Samuel G. Baker, Wilmington, Del., to du Pont.
Construction of a blasting cartridge consisting of an inner explosive core and an outer sheath containing ammonium nitrate and at least one cooling salt. No. 2,048,831. Albert G. White, Saltcoats, Scotland, to Imperial Chemical Industries, Ltd., England.
A propellent powder charge containing a central core of cloth impregnated with a flash suppressing alkali metal salt No. 2,050,871. Richard G. Woodbridge, Wilmington, Del., to du Pont.

Fine Chemicals

Production of aromatic para-amino-aldehydes. No. 2,048,006. Donald Hutton, Carney's Point, N. J., to du Pont.
Method for the preparation of thiuram monosulfides. No. 2,048,043. Ira Williams and Carlton W. Croco, Wilmington, Del., to du Pont.
Production of an o-alkyl ether of harmol. No. 2,048,622. Frank Lee Pyman and Hyman Henry Lionel Levene, Nottingham, England, to Boots Pure Drug Co., Ltd., Nottingham, England.
Process of denicotizing tobacco by treating with an organic nicotine solvent. No. 2,048,624. Wilhelm Heinrich Roselius, Bremen, Germany.
Preparation of an oil soluble aromatic mercury salt. No. 2,049,294. Albert L. Flenner, Wilmington, Del., to du Pont.
Preparation of a basic bismuth salt of an aromatic mercury compound. No. 2,050,592. Karl Streitwolf, Frankfort, Alfred Fehrle, Bad Soden, and Paul Fritzschemand Walter Herrmann, Frankfort, to Winthrop Chemical Co., N. Y. City.
Production of acrylic acid chloride from beta chloropropionic acid. No. 2,050,752. Hans Fikentscher, Ludwigshafen, Germany, to German I.G.
Preparation of quinoline derivatives. No. 2,050,971. Heinrich Jensch, Frankfort, Germany, to Winthrop Chemical Co., N. Y. City.
Preparation of a benzotrifluoride compound having antiseptic properties. No. 2,050,075. Ernest H. Volwiler, Highland Park, and Elmer B. Vliet, Pine Bluff, Ill., to Abbott Laboratories, N. Chicago, Ill.
Dehydration of an aqueous aliphatic acid by azeotropic distillation. No. 2,049,440. Jack J. Gordon, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.
A continuous process of dehydrating aqueous materials containing at least one of the lower aliphatic acids by a method including azeotropic distillation. No. 2,049,441. Jack J. Gordon, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y.
Preparation of methoxy-cinchonidine gluconate. No. 2,049,442. Thomas Haegland, Philadelphia, to Merck, Rahway, N. J.
Preparation of vanadium compounds of n-methylene sulfonic acids of diamino dihydroxy arsenobenzene and its sodium salt. No. 2,049,662. George W. Raiziss and Abraham I. Kremens, Philadelphia, to Abbott Laboratories, N. Chicago.
Production of glucosides of higher aliphatic alcohols. No. 2,049,758. Heinrich Bertsch and Gertrud Rauchalles, Chemnitz, Germany, to H. Th. Boehme Aktiengesellschaft, Chemnitz, Germany.
Method of obtaining pure phenyl-mercury acetate from crude reaction mixtures. No. 2,050,018. Mahlon J. Rentschler, Willoughby, Ohio, to Hamilton Laboratories, Hamilton, Ohio.
Production of a cellulose organic acid ester composition containing fenchyl alcohol as a plasticizer. No. 2,051,198. Stewart J. Carroll and Henry B. Smith, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.
Preparation of hydroxyalkyl esters of the dicarboxylic acid esters of cellulose. No. 2,051,219. Carl J. Malm and Charles R. Fordyce, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.
Process for manufacturing poly-membered cyclic amines. No. 2,051,575. Leopold Ruzicka, Zurich, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.
Process of making reflex copies. No. 2,051,582; 2,051,583; and 2,051,585. Lodewijk Pieter Frans van der Grinten, Venlo, Netherlands, to Naamlooze Vennootschap Chemische Fabriek L. van der Grinten, Venlo, Netherlands.
Method of making copies with reduced screen structure. No. 2,051,584. Lodewijk Pieter Frans van der Grinten, Venlo, Netherlands, to Naamlooze Vennootschap Chemische Fabriek L. van der Grinten, Venlo, Netherlands.
Method of making irradiation subdividing screens. No. 2,051,586. Lodewijk Pieter van der Grinten, Venlo, Netherlands, to Naamlooze Vennootschap Chemische Fabriek L. van der Grinten, Venlo, Netherlands.

Glass and Ceramics

Process of making luminescent glass. No. 2,049,765. Hellmuth Fischer, Ilmenau, Germany.

Industrial Chemicals, Apparatus, etc.

Distillation process for dehydrating organic compounds. No. 2,048,178. Samuel C. Carney, Berkeley, Calif., to Shell Development Co., San Francisco.
Flue apparatus for utilization of waste heat. No. 2,048,242. George Yates, Chicago.
An intermeshing screw apparatus adapted to converting viscous plastic materials. No. 2,048,286. Fred Forrest Pease, Squantum, Mass., to Lever Brothers Co., Cambridge, Mass.
Construction of a hydraulic filter press. No. 2,048,352. Heinrich Reitz, Bitterfeld, Germany, to German I. G., Frankfort, Germany.
Froth flotation method in the separation of ores, adding to the repulped ore pulp a cyanide compound and one or more metallic salts capable of precipitating ferro-cyanide. No. 2,048,369. Frederick A. Brinker, Denver.
The differential froth flotation treatment to separate ores is preceded by treating ores containing copper with a cyanide compound in the presence of sulfur dioxide. No. 2,048,370. Frederick Brinker, Denver.
Construction of a gas scrubber. No. 2,048,403. Kevork K. Nahigyan, Worcester, Mass., to Riley Stoker Corp., Worcester.
Process for recovering selenium from anode mud, slimes, and sludges containing also copper and precious metals. No. 2,048,563. Frank F. Poland, New Brunswick, N. J., to American Smelting and Refining Co., N. Y. City.
Use of tri-ethanolamine in electrodepositing metals. No. 2,048,594. Charles Joseph Brockman, Athens, Ga.
Preparation of fur for felting by use of an aqueous carroting solution free from mercury and other heavy metallic catalytic salts. No. 2,048,-645. Constantine F. Fabian, Brookfield, Conn. and Alexander N. Sachanen, Luxemburg, Luxemburg, by mesne assignments to The Non-Mercuric Carrot Co., Danbury, Conn.
Separation of carbon dioxide from gaseous mixtures by treatment with an organic solvent at a temperature below —59° F. No. 2,048,656. Franklin B. Hunt and Robert L. Turner, Chicago, to The Liquid Carbonic Corp., Chicago.
Production of mixtures of the higher members of the aliphatic alcohol series. No. 2,048,662. Martin Luther, Mannheim, and Wilhelm Dietrich, Oppau, Germany, to German I. G., Frankfort, Germany.
Apparatus for manufacturing metal catalysts. No. 2,048,668. Walter Baensch, Muhlheim, and Wolf Klaphake, Berlin, Germany, to Schering-Kahlbaum A. G., Berlin, Germany.
An electrical process for the liberation of plant fibers. No. 2,048,719. Arley C. Whitford, Alfred, N. Y., to J. Weston Allen and Everett E. Kent, both of Newton, Mass., and Henry W. Packer, Wellesley, Mass.
Production of an antioxidant consisting of an indane amide. No. 2,048,781. David Craig, Silver Lake Village, Ohio, to B. F. Goodrich, N. Y. City.
Plaster casting molds made of a resilient gel of completely polymerized vinyl chloride, a plasticizer, and a wax. No. 2,048,808. George Oenslager, Akron, Ohio, to B. F. Goodrich, N. Y. City.
Production of edible fatty esters from cotton-seed oil, glycerol, and phosphoric acid. No. 2,048,818. Harvey D. Royce, Savannah, Ga., to The Southern Cotton Oil Co., New Orleans.
Production of substituted acid amides by treating a quaternary ammonium salt of an oxazole derivative with a strong alkali. No. 2,048,-821. Wilhelm Schneider, Dessau in Anhalt, Germany, to German I. G., Frankfurt, Germany.
Production of vinylacetylene by the polymerization of acetylene in the presence of a catalyst. No. 2,048,838. Albert S. Carter, Wilmington, Del., and Frederick B. Downing, Carneys Point, N. J., to du Pont.
Method of producing cement by calcining dolomitic rock, treating with an aqueous solution of magnesium chloride at a temperature which must not exceed 105° C., and leaching. No. 2,048,967. Clarence R. Rex, Toledo, Ohio.
Use of pressure in the making of aluminum chloride from carbon, alumina, and chlorine at high temperatures. No. 2,048,987. Gordon M. Atherholt, Mt. Lebanon, Pa., by mesne assignments to Gulf Oil Corp., Pittsburgh.
Preparation of 1,3-diamino-2-methyl propanol-2. No. 2,048,990. Edgar C. Britton and Howard S. Nutting, Midland, Mich., to Dow Chemical Co., Midland.
Production of a color-photographic bleach-out layer consisting of a colloidal carrier dyed by at least one acid azo-dyestuff, a sensitizer, and its activating agent. No. 2,049,005. Bela Gaspar, Brussels, Belgium.
Production of hydrocarbon mixtures. No. 2,049,019. Mathias Pier, Heidelberg, Friedrich Christmann, Ludwigshafen, and Ernst Donath, Mannheim, Germany, to German I. G., Frankfort, Germany.
Method of controlling the size of calcium sulfate crystals produced when phosphate rock is treated with reagent containing sulfate ions. No. 2,049,032. William C. Weber, Larchmont, Ralph W. Shafer, N. Y. City, and Elliott J. Roberts, Westport, Conn., to Dorr Co., Inc., N. Y. City.
Apparatus for recovering sulfur from sulfur-bearing gases. No. 2,049,-160. George Homer Gleason, Montclair, N. J., and Alfred C. Loonam, Brooklyn, N. Y., to Guggenheim Bros., N. Y. City.
An apparatus for testing the viscosity of liquids. No. 2,049,162. Clifford S. Healy, Chicago.
Production of an alkali-earth metal salt of aurothioglycolic acid. No. 2,049,198. Raymond Delange, Versailles, France, to Fabriques de Produits de Chemie organique de Laire, Dept. of Seine, France.
Reaction products of a halogenated paraffin wax and a carboxylic acid salt. No. 2,049,207. Walter E. Lawson, Woodbury, N. J., to du Pont.
Production of sulfuric from acid sludge of high oil content obtained from the sulfuric acid purification of hydrocarbon material. No. 2,049,-243. Frank J. Bartholomew, Charlotte, N. C., to Chemical Construction Corp., N. Y. City.
Improved method of converting sodium sesquicarbonate to sodium carbonate decahydrate. No. 2,049,249. George L. Cunningham, Niagara Falls, to Mathieson Alkali Works, N. Y. City.

Production of cuprous cyanide from an impure solution of cuprous chloride and an alkali metal cyanide. No. 2,049,358. Charles Dangelmajer, Niagara Falls, to du Pont.

Production of cuprous chloride from copper and chlorine. No. 2,049,402. Christian J. Wernlund, Niagara Falls, to du Pont.

Preparation of olefin-polyamines by heating an olefin dihalide and ammonia in the presence of water. No. 2,049,467. Nathan M. Mnookin, Kansas City, Mo.

Manufacture of saturated fibrous structures for use in products requiring water or grease resistance. No. 2,049,469. Izador J. Novak, Bridgeport, Conn., to Raybestos-Manhattan Inc., Bridgeport, Conn.

Cuprous oxide in a photoelectric cell. No. 2,049,472. Walter Rosett, Oakcrest, Va.

Separation of dimethyl and trimethylamines by distillation. No. 2,049,486. Dale F. Babcock, Wilmington, Del., to du Pont.

An oil purifying system. No. 2,049,498. Franklin Hardinge, Chicago.

A friction element containing a metallic formate which will decompose when subjected to friction heat. No. 2,049,522. Ray E. Spokes and Hobart H. Willard, Ann Arbor, Mich., to American Brakeblok Corp., N. Y. City.

Process of enhancing the natural color of fresh citrus fruit and simultaneously inhibiting and retarding the decay by contacting fruit with an appropriate emulsion. No. 2,049,563. Rodney B. Harvey, St Paul, Minn., by mesne assignment to Food Machinery Corp., San Jose, Calif.

Removal of volatile organic vapors from a gaseous medium by contact with a metallic perchlorate. No. 2,049,608. Glenn C. Forrester, Niagara Falls.

Production of zinc sulfide from the reaction between hydrogen sulfide and zinc sulfate. No. 2,049,646. Edmund J. Flynn, Palmerton, Pa., to The New Jersey Zinc Co., N. Y. City.

A composition substantially unaffected by light or storage, characterized by a high dispersability in rubber, containing the zinc salt of mercaptothiazole dissolved in the zinc salt of cocoanut oil acids. No. 2,049,785. William F. Tuley, Naugatuck, Conn., to U. S. Rubber Products, N. Y. City.

Non-metallic organic cyanogen compound used to impart case hardening properties to fused salt bath in cementation process of ferrous substances. No. 2,049,806. Donald A. Holt, Niagara Falls, to du Pont.

Preparation of acoustic material consisting of granulated naval cork, granulated pumice, powdered magnesia asbestos, and rubber solution. No. 2,049,832. John Dean, San Francisco, one fourth to Daniel Campbell.

Preparation of slag cement consisting of blast slag, calcium oxide, calcined bauxite, feldspar, calcium chloride, and magnesium sulfate. No. 2,049,881. George Witty, Long Island City, N. Y.

Preparation of a bleaching agent containing an aldehyde and an acid halogenide. No. 2,049,888. Souren Z. Avedikian, N. Y. City.

Bleaching glyceride type, sulfonated oil by treating with hydrogen peroxide in the presence of a cobalt containing bleaching promotor. No. 2,049,975. Joseph S. Reichert and Amos G. Cole, Niagara Falls, to du Pont.

Process for removing suspended acid mist from hydrogen peroxide vapors. No. 2,049,979. Carl W. Tucker, Niagara Falls, to du Pont.

Method of washing fibrous material to remove solid and liquid impurities. No. 2,050,080. Arthur U. Ayres, Chestnut Hill, Pa., to Sharples Specialty Co., Philadelphia.

Chemically treating wood surfaces to facilitate photographic reproduction of wood grains. No. 2,050,118. Lawrence J. Pearson, Wyncote, Pa., to Philco Radio and Television Corp., Philadelphia.

Use of cobaltic amine to protect metals against alkaline liquids. No. 2,050,122. Werner Reuss and Frederich Weldes, Dusseldorf-Benrath, Germany, to Henkel and Cie, Gesellschaft mit beschrankter Haftung, Dusseldorf, Germany.

A washing apparatus to remove sulfur and dust from flue gases. No. 2,050,160. George H. C. Corner and Joseph McGinn, Birmingham, England, to Imperial Chemical Industries, Ltd., England.

Production of aliphatic sulfur compounds of high molecular weight. No. 2,050,169. Eberhard Elbel and Ernst L. Muller, Dusseldorf, Germany, to Henkel and Cie, Gesellschaft mit beschrankter Haftung, Dusseldorf, Germany.

Method of producing derivatives of hydroxy aryl compounds. No. 2,050,188. William M. Lee, Bala-Cynwyd, Pa. and Lee H. Clark, Charleston, W. Va., to Sharples Solvents Corp., Philadelphia.

Production of a garnet abrasive by treating garnet grain with an alkali halide mixture in the presence of oxygen between 550° C. and 850° C. No. 2,050,212. Royal H. Rizor, Detroit, Mich., by mesne assignment to Mid-West Abrasive Co.

Process for the production of normal butyl alcohol, acetone, and ethyl alcohol by the fermentation of mash. No. 2,050,219. Cornelius F. Artzberger, Terre Haute, Ind., to Commercial Solvents Corp., Terre Haute, Ind.

Preparation of alkaline trisodium phosphate by the addition of caustic soda to a strong, trisodium phosphate solution. No. 2,050,249. Howard Adler, Chicago Heights, Ill., to Victor Chemical Works.

Method of making fine straw from synthetic straw. No. 2,050,286. Camille Dreyfus, N. Y. City and William Whitehead, Cumberland, Md., to Celanese Corp. of America, N. Y. City.

Preparation of lower aliphatic acid anhydrides by the thermal decomposition of lower aliphatic acid diesters of lower aliphatic polyhydroxy alcohols. No. 2,050,287. Henry Dreyfus, London, England.

Extraction process for the concentration of lower aliphatic acids. No. 2,050,288. Henry Dreyfus, London, England.

Continuous process of extracting starch from corn. No. 2,050,330. Frederick L. Jeffries, La Grange, Ill., to International Patents Development Co., Wilmington, Del.

Preparation of material having high electrical resistivity by baking wood which has been charred and ground. No. 2,050,357. Leon McCulloch, Pittsburgh, to Westinghouse Electric & Mfg. Co., E. Pittsburgh.

Preparation of sulfur compounds by the reaction between alkali metal sulfides and aromatic compounds having at least two halogen atoms in aliphatic side-chains. No. 2,050,370. Ludwig Orthner, Leverkusen-I. G.-Werk, and Wilhelm Becker, Cologne-Mulheim, Germany, to German I. G., Frankfort, Germany.

A continuous, self-sustaining process for the recovery of chemicals and heat in the treatment of waste liquor containing combustible organic matter. No. 2,050,400. Charles L. Wagner, Boonton, N. J., by mesne assignment to The Babcock & Wilcox Co., N. Y. City.

Foam elimination in the reclamation of used oil. No. 2,050,415. William T. Bissell, Indianapolis, Ind., to Journal Box Servicing Corp., Indianapolis, Ind.

Continuous process for producing ethyl alcohol by reacting ethylene and water vapor under high pressure, in excess of 100 lbs. per square inch, in the presence of a dilute non-volatile inorganic acid catalyst at a temperature above 170° C. No. 2,050,442. Floyd J. Metzger, N. Y. City, to Air Reduction Co., N. Y. City.

Catalytic process for making ethyl alcohol from ethylene and water vapor in the presence of a dilute non-volatile inorganic catalyst, materially less than 50% acid, at a temperature not above 300° C. and under a pressure in excess of 1000 lbs. per square inch. No. 2,050,443. Floyd J. Metzger, N. Y. City, to Air Reduction Co., N. Y. City.

A continuous process for making isopropyl alcohol by bringing a mixture of propylene and water vapor in intimate contact with a dilute non-volatile inorganic acid catalyst at a temperature in excess of 170° C. No. 2,050,444. Floyd J. Metzger, N. Y. City, to Air Reduction Co., N. Y. City.

A continuous process for making ethyl alcohol from ethylene and water vapor under pressure in excess of 100 lbs. per square inch at temperatures between 170° C. and 300° C. by means of an aqueous phosphoric acid catalyst. No. 2,050,445. Floyd J. Metzger, N. Y. City, to Air Reduction Co., N. Y. City.

Preparation of sodium glutamate. No. 2,050,491. George S. Kumagai, Los Angeles.

Method of manufacturing salad oil from crude cotton seed oil by refining crude product, winterizing by seeding, removing crystals of fatty glyceride, and adding small amount of lecithin to retard further crystallization. No. 2,050,528. Donald P. Grettie, Chicago, to Industrial Patents Corp., Chicago.

Glass surface treated with hydrofluosilicic acid and stannous chloride to give glass an unusual reaction to vapor. No. 2,050,540. Harold R. Moulton, Sturbridge, Mass., to American Optical Co., Southbridge, Mass.

Preparation of sulfurized aliphatic halogen derivatives. No. 2,050,583. Ludwig Orthner, Leverkusen-I. G.-Werk, and Heinrich Freudenberger, Frankfort, Germany, to German I. G., Frankfort, Germany.

Production of diethyl ether by hydrolizing ethyl sulfate and oxidation, followed by purification with bisulfite solution and treatment with mercuric oxide. No. 2,050,600. Henry L. Cox, S. Charleston, and Paul Greer, Charleston, W. Va., by mesne assignments to Union Carbide and Carbon Corp.

Process of breaking water-in-oil emulsions by use of the condensation product of a cyclic sulfonic acid and an oil-soluble non hydroxy alkyl amine. No. 2,050,639. Truman B. Wayne, Houston, Tex.

Process of breaking a water-in-oil emulsion by use of the condensation product of a cyclic sulfonic acid and an aralkyl amine with an amino group in an alkyl side chain. No. 2,050,640. Truman B. Wayne, Houston, Tex.

Production of linoleum by process involving the oxidation of drying or semi drying oil, admixture with filler material to form moldable composition, subjecting to pressure and converting oxidized oil constituents into linoxyn. No. 2,050,646. Robert D. Bonney, Glen Ridge, and Walter S. Egge, W. Orange, N. J., to Congoleum-Nairn, Inc.

Method of separating terpene alcohols from longleaf yellow pine oil. No. 2,050,671. Donald H. Sheffield, Brunswick, Ga., to Hercules Powder Co., Wilmington, Del.

Production of sulfur from pyrites by means of reduction of sulfur dioxide. No. 2,050,708. Axel R. Lindblad, Djursholm, Sweden.

Process and apparatus for contacting ozone and water. No. 2,050,771. Justin F. Wait, N. Y. City.

Method of producing higher aliphatic alcohols from ethyl alcohol and methyl alcohol in the presence of hydrogen and a heated catalytic material containing magnesia and a metallic compound related to lead oxide, between 200° C. and 400° C. No. 2,050,788. Otto Fuchs and Wilhelm Querfurth, Constance, Germany.

Production of condensation products from lower aliphatic alcohols. No. 2,050,789. Otto Fuchs, Frankfort, and Wilhelm Querfurth, Mainz-Mombach, Germany.

A continuous process for recovering phosphorus when present in high dilution in gases by treating with an aqueous cooling medium varying in acidity between .1 and 1 normal. No. 2,050,796. Friedrich P. Kerschbaum, Berlin-Wilmersdorf, Germany, and Stapleton D. Gooch, Lake Wales, Fla.

An apparatus for the recovery of phosphorus present in gases in dilute form. No. 2,050,797. Friedrich P. Kerschbaum, Winterhaven, and Stapleton D. Gooch, Pembroke, Fla., to Pembroke Chemical Co., Pembroke, Fla.

Method of conditioning barium sulfide in formation of sodium and zinc sulfides. No. 2,050,802. Thomas A. Mitchell and Royal L. Sessions, Denver, Colo., by mesne assignment to Hughes-Mitchell Processes, Denver, Colo.

Method of refining vegetable oils. No. 2,050,844. Edward M. James, Moylan M. James, Moylan, Pa., to Sharples Specialty Co., Philadelphia.

Catalytic process of purifying distilled ethyl alcohol. No. 2,050,908. Herman F. Willkie, Windsor, Ont., to Continental Distilling Corp., Philadelphia.

Production of alcohols from an olefin and water in the presence of a hydrating catalyst consisting of cadmium metaphosphate and a small amount of a substance related to the metaphosphates of barium, strontium, titanium, chromium, and tellurium. No. 2,051,046. George F. Horsley, Norton-on-Tees, England, to Imperial Chemical Industries, Ltd., England.

Preparation of isopropyl alcohol from propylene and water vapor, subjected to elevated temperatures in the presence of a catalyst consisting of a metal phosphate and phosphoric acid. No. 2,051,144. Walter P. Joshua, Cheam, and Herbert M. Stanley, Tadworth, and John B. Dymock, Sutton, England.

Preparation of a resinous solid as an inhibitor for pickling metals. No. 2,051,218. George L. Magoun and Deal H. Tompkins, Nitro, W. Va., by mesne assignment to Monsanto Chemical Co., St. Louis, Mo.

Process for the manufacture of tertiary alkyl phenols by condensation of a phenol and a monohydric tertiary aliphatic alcohol in the presence of anhydrous aluminum chloride at a temperature of less than 50° C. No. 2,051,300. Ralph C. Huston, E. Lansing, Mich., to Michigan State Board of Agriculture, E. Lansing, Mich.

Process of obtaining hydrogen from hydrocarbon containing gas. No. 2,051,363. John S. Beekley, Charleston, W. Va., by mesne assignment to du Pont.

Production of synthetic lubricants by heating diphenyloxide between its decomposition temperature and 400° C. and subsequent separation of the fraction distilling between 200°-350° C. at an absolute pressure of 5-10 mm. No. 2,051,404. Edgar C. Britton, Midland, Mich., to Dow Chemical Co., Midland, Mich.

An apparatus for testing the viscosity of liquids. No. 2,051,523. Francis M. Hess.

Recovery of krypton and xenon from the atmosphere by selective liquefaction. No. 2,051,576. Joseph L. Schlitt, Darien, Conn., to Air Reduction Co., N. Y. City.

Preparation of an electrolytic device containing cooperating aluminum electrodes and silicic acid gel, containing finely divided solid boric acid, in between. No. 2,051,592. John R. T. Craine, Pittsfield, Mass., to General Electric Co., Schenectady, N. Y.

Method of preparing slow baked raised products without yeast or carbon dioxide by means of an oxygen evolving compound incorporated

within the dough. No. 2,051,745. Joseph S. Reichert, Niagara Falls, N. Y., and William J. Sparks, Urbana, Ill., to du Pont.

Method of effecting catalytic exothermic gaseous reactions. No. 2,051,774. Robert V. Kleinschmidt, Stoneham, Mass., to du Pont.

Production of a mouldable casein by reacting moisture containing granular casein with a water soluble alcohol at about 50° C. No. 2,051,779. Friedrich von Koch, Wuppertal-Barmen, Germany, to Pfenning-Schumacher-Werke G. m. b. H., Wuppertal-Barmen, Germany.

Leather and Tanning

Process of tanning leather including treatment with a sodium bisulfite solution. No. 2,049,547. Harold S. Shaw, Grand Rapids, Mich.

Metals, Alloys, Ores

Production of a hydrogenation-dehydrogenation catalyst, a mixture of cadmium chromite and a chromite metal. No. 2,047,945. Herrick R. Arnold, Elmhurst, and Wilbur A. Lazier, Del., to du Pont.

Method of roasting finely divided sulfide ore by which scar formation on the walls of the roasting chamber is avoided. No. 2,047,995. Henry John Cordy, Suphide, and William John Burgoyne, Belleville, Ont., Canada, to General Chemical.

An apparatus and process for effecting changes in degree of oxidation of finely divided magnetic metals and metal compounds. No. 2,048,111. Rudolph Gahl, Berkeley, Calif.

Process for the reduction of metal-oxygen compounds. No 2,048,112. Rudolph Gahl, Berkeley, Calif.

Production of a nickel-iron alloy containing also titanium. No. 2,048,163. Norman B. Pilling, Elizabeth, and Paul Dyer Merica, Plainfield, N. J., to International Nickel, N. Y. City.

Process of hardening an alloy composed of an iron base, titanium, and usual iron alloying elements. No. 2,048,164. Norman B. Pilling, Elizabeth, N. J., and Paul D. Merica, N. Y. City, to International Nickel.

Production of nickel base alloy containing also iron and titanium. No. 2,048,165. Norman B. Pilling, Elizabeth, N. J., and Paul D. Merica, N. Y. City, to International Nickel.

Production and method of hardening a copper-nickel-titanium alloy. No. 2,048,166. Norman B. Pilling, Elizabeth, N. J., and Paul D. Merica, N. Y. City, to International Nickel.

Production of nickel-chromium-iron-titanium alloys. No. 2,048,167. Norman B. Pilling, Westfield, N. J., and Paul D. Merica, N. Y. City, to International Nickel.

Production of a sintered alloy containing carbon, chromium, and tungsten. No. 2,048,239. Roy T. Wirth, East Cleveland.

Plated metallic body with carbide surface. No. 2,048,276. Charles A. Marlies and George E. White, New York, N. Y., one half to Bruno S. Teschner, N. Y. City.

Zinc base alloy containing also copper and at least one metal of the nickel and manganese group, capable of use in manufacture of wrought products. No. 2,048,287. Willis M. Peirce and Edmund A. Anderson, Palmerton, Pa., to New Jersey Zinc Co., N. Y. City.

Zinc base alloy containing manganese and nickel, adapted to resist cold flow. No. 2,048,288. Willis M. Peirce and Edmund A. Anderson, Palmerton, Pa., to New Jersey Zinc.

Production of a zinc base alloy containing at least one metal from manganese, nickel group and small amounts of cadmium. No. 2,048,289. Willis M. Peirce and Edmund A. Anderson, to New Jersey Zinc.

Production of cast iron with ferritic-graphitic surface, coated with enamel. No. 2,048,309. Clyde E. Williams, Daniel E. Krause, and Clarence H. Lorig, Columbus, Ohio, to Battelle Memorial Institute, Columbus.

Method of case hardening steel by heating to a high temperature in a carburizing pot with comminuted born carbide and then quenching. No. 2,048,526. Edward Van der Pyl, Holden, Mass., to Norton Co., Worcester, Mass.

Production of an alloy containing copper, beryllium, aluminum, and cobalt. No. 2,048,549. Richards H. Harrington, Schenectady, N. Y., to General Electric Co.

Production of a hard alloy containing palladium, silver, gold, and a metal of the iron group. No. 2,048,647. Otto Feussner and Alfred Jedele, Hanau, Germany, to W. C. Heraeus, Gesellschaft mit beschrankter Haftung, Hanau, Germany.

Production of an age hardening alloy consisting of palladium, silver, and an element from the gold and copper group. No. 2,048,648. Otto Feussner and Alfred Jedele, Hanau, Germany.

An apparatus for making amalgams. No. 2,048,678. Charles F. Bird, American Falls, Idaho; one-half, to Basil Edwards, Salt Lake City, Utah.

Special metallurgical treatment of a cobalt-chromium-tungsten-carbon alloy. No. 2,048,706. Carl Pfanstiehl, Highland Park, Ill., to Pfanstiehl Chemical Co., Waukegan, Ill.

Production and treatment of a cobalt-chromium-tungsten-carbon alloy. No. 2,048,707. Carl Pfanstiehl, Highland Park, Ill., to Pfanstiehl Chemical Co., Waukegan.

Method of heat treating malleableized cast iron. No. 2,048,748. Carl F. Lauenstein, Indianapolis, Ind., to Link-Belt Co., Chicago.

Production of alloys consisting of iron and copper. No. 2,048,824. Kenneth M. Simpson, N. Y. City.

An apparatus for condensing zinc vapors. No 2,048,863. Erwin C. Handwerk and George T. Mahler, Palmerton, Pa., to New Jersey Zinc Co., N. Y. City.

Method of refining steel by treating cold steel scrap with a mixture of slag forming materials, consisting of calcium carbide, silica, and a low melting alkali metal compound used in such proportions to form liquid slag below the melting point of steel. No. 2,049,004. John W. Flannery, Portland, Ore.

Production of alloy steel from an unreduced compound of the alloying metal and a reducing agent. No. 2,049,081. William R. Saltrick, Purley, England, to Robert W. Stimson, N. Y. City.

Metallurgical process for manufacturing alloys, substantially free from foreign substances. No. 2,049,091. Robert W. Stimson, N. Y. City.

Apparatus designed for the pouring of molten high chromium alloy iron and steel. No. 2,049,148. William B. Arness, Baltimore, by mesne assignments to Rustless Iron and Steel Corp., Baltimore.

Production of copper-titanium alloys immersing the titanium in flux containing a fluid fused salt of an alkaline earth metal to prevent oxidation of the metal. No. 2,049,291. George F. Comstock, Niagara Falls, to Titanium Alloy Manufacturing Co., N. Y. City.

Production of hard alloys containing tungsten and titanium carbide. No. 2,049,317. Robert Pinta, Paris, France, to General Electric, Schenectady.

Production of a negative thermocouple alloy of nickel and titanium, and a positive alloy of nickel and copper. No. 2,049,443. Otto Hermann, St. Louis, Mo.

A welded, fabricated structure containing a silicon-manganese-copper alloy. No. 2,049,449. Herbert C. Jennison, Bridgeport, Conn., to The American Brass Co., Waterbury, Conn.

Extraction of osmium and ruthenium from ores and minerals. No. 2,049,488. Geza Braun, N. Y. City, to Standard Brands, Inc., N. Y. City.

Production of an alloy containing chromium, silver, cadmium, and copper, characterized by fluidity in molten state, high resistance to oxidation and to grain growth, and a quenched hardness. No. 2,049,500. Franz R. Hensel, Indianapolis, Ind., by mesne assignment to P. R. Mallory Co., Indianapolis, Ind.

Method of separating ferrous metal from extraneous matter by treatment with an acid solution containing a halogen acid, dissolved copper, and an organic inhibitor. No. 2,049,517. Albert J. Saukaitis, Philadelphia, to American Chemical Paint Co., Ambler, Pa.

Process for the purification of nickel by intermixing crude metal in molten state with fluid slag. No. 2,049,721. Rene M. Perrin, Paris, France, to Societe d'Electrochimie, d'Electrometallurgie et des Acieries Electriques d'Ugine, Paris, France.

Production of brittle iron-nickel alloys. No. 2,049,927. Walter E. Remmers, Western Springs, Ill., to Western Electric Co., N. Y. City.

Method of testing gas for use as a protective atmosphere in the heat treatment of metal. No. 2,049,947. Frank T. Cope, Salem, Ohio, to Electric Furnace Co., Salem, Ohio.

An alloy containing copper, tin, gold, and a member of the platinum-palladium group, to be used in the manufacture of dental appliances. No. 2,050,040. Richard L. Coleman and Keith Smith, Jr., West Hartford, Conn.

A weld iron made of an alloy consisting of chromium, manganese, boron, carbon, silicon, iron, and a member of the tungsten-molybdenum group. No. 2,050,043. Anthony G. de Golyer, N. Y. City, to Vulcan Alloy Corp.

Method of making a decorative copper-aluminum alloy. No. 2,050,069. Cyril S. Smith, Cheshire, Conn., to American Brass Co., Waterbury, Conn.

Method of making a metal carbide alloy by mixing molybdenum carbide powder, iron powder, and cobalt powder, and adding ferro vanadium and ferro titanium. No. 2,050,266. Walter T. Boyer, Stamford, Conn.

Heat treating silicon steel by coating with iron oxide, oxidizing, and annealing in hydrogen above 900° C. No. 2,050,305. Albert A. Frey and Stephen L. Burgwin, Wilkinsburg, Pa., to Westinghouse Electric & Mfg. Co., E. Pittsburgh.

Recovering copper, tin, and lead from "white matte" by leaching process and chemical treatment. No. 2,050,319. Charles W. Hanson, Plainfield, N. J., to American Smelting and Refining Co., N. Y. City.

Method of pickling metal in a strong mineral acid bath containing a compound formed by sulfonating an organic hydroxylic compound and a substance related to mustard oils and thioureas. No. 2,050,354. Charles H. McCollam, Dwight L. Warrick, and John M. Gotschall, Canton, Ohio, to The Timken Roller Bearing Co., Canton, Ohio.

Method of pickling metal in a strong mineral acid bath containing a substance formed by sulfonating creosote and thiocarbanilide. No. 2,050,355. Charles H. McCollam, Dwight L. Warrick, and John M. Gotschall, Canton, Ohio, to The Timken Roller Bearing Co., Canton, Ohio.

Method of preparing iron-nickel alloys by electrically annealing elements in hydrogen at 1150° C, and also melting and freezing in pure hydrogen. No. 2,050,387. Howard Scott, Forest Hills, Pa., to Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

Process of heat treating silicon iron. No. 2,050,408. Trygve D. Yensen, Forest Hills, Wilkinsburg, Pa., to Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

Process of incorporating silicon into steel. No. 2,050,460. Rene Perrin, Paris, France, to Societe d'Electrochimie d'Electromemetallurgie et des Acieres Electriques d'Ugine, Paris, France.

An electrode for electric condensers made from an aluminum base alloy. No. 2,050,587. Samuel Ruben, New Rochelle, N. Y., to Ruben Condenser Co., Dover, Del.

Heat treatment of copper base alloys containing about 4% silicides. No. 2,050,601. William C. Ellis, Rockville Centre, N. Y., to Bell Telephone Laboratories, N. Y. City.

Method of quickly dephosphorizing steel in a converter. No. 2,050,803. Rene Perrin, Paris, France, to Societe d'Electrochimie, d'Electrometallurgie et des Acieries Electriques d'Ugine, Paris, France.

An age hardened tough cobalt base alloy containing also tungsten. No. 2,050,865. Wesley P. Sykes, Cleveland Heights, Ohio, to General Electric Co., Schenectady, N. Y.

Electrolytic production of an oxide-coating upon aluminum. No. 2,050,872. Harold K. Work, Oakmont, Pa., to Aluminum Co. of America, Pittsburgh.

Process for preparing refractory linings for metallurgical furnaces. No. 2,051,002 and 2,051,003. John M. Knote, South River, N. J., to Quigley Co., South River, N. J.

Process of recovering gold from ore concentrates by washing, treating with lime, adding lead oxide, and mixing in the presence of cyanide. No. 2,051,285. Alfred L. Blomfield, Kirkland Lake, Ont., Canada.

Production of an iron alloy containing also molybdenum, chromium, and copper. No. 2,051,358. John A. Zublin, Bel Air, Calif.

Alloy steel containing chromium, a metal of the nickel group, silicon, a metal of the tungsten group, iron, and carbon is hardened by heat treating within the temperature range of 1200-1800° F. No. 2,051,415. Peter Payson, N. Y. City, to Crucible Steel Co., N. Y. City.

Process of electrolytically treating an alloy of iron cobalt and copper to obtain a ferrocobalt alloy. No. 2,051,433. Francis L. Bosqui, N'Kana, Northern Rhodesia, to Rhokana Corp., Ltd., N'Kana, Northern Rhodesia.

Method of making sintered iron metal products with a hardened portion by use of a powdered metal having a great affinity for nitrogen before subjection to the sintering operation. No. 2,051,454. Albert W. Morris, Springfield, Mass.

Production of an electric resistance element consisting of an alloy of chromium, zirconium, and nickel. No. 2,051,562. James M. Lohr, Morristown, N. J., to Driver-Harris Co., Harrison, N. J.

Production of a weld rod having a coating containing ilmenite, talc, and a binder silicate. No. 2,051,775. Harry R. Pennington, Muncie, Ind., to Indiana Steel and Wire Co., Muncie, Ind.

Naval Stores

Production of a triethanolamine hydroxyabietate. No. 2,050,263. Joseph N. Borglin, Wilmington, and Leavitt N. Bent, Holly Oak, Del., to Hercules Powder Co., Wilmington, Del.

Halogenation of compounds containing an abietyl group in the presence of a catalyst. No. 2,050,979. Joseph N. Borglin, Wilmington, Del., to Hercules Powder Co., Wilmington, Del.

Method of making a dry rosin composition. No. 2,050,997. Thomas W. Asbury, Valdosta, Ga., Richard A. Asbury, Joliet, Ill., and John F. Fredriksson, Baldwin, N. Y., to American Cyanamid and Chemical Corp., N. Y. City.
Method of preparing a hydrogenated polyhydric alcohol ester of abietic acid. No. 2,051,796. Irvin W. Humphrey, Wilmington, Del., to Hercules Powder Co., Wilmington, Del.

Paper and Pulp

Absorbent, cloth-like paper, made by adding viscose to ungelatinized paper stock in the presence of some regenerated cellulose, and treating with 100% glycerine. No. 2,048,293. George A. Richter and Milton O. Schur, Berlin, N. H., to Brown Co., Berlin, N. H.
Method of manufacturing paper using an alkaline substance which has a water solubility in excess of 50 parts per million. No. 2,050,262. Levis M. Booth, Plainfield, N. J.
Process of manufacturing paper pulp from wood chips. No. 2,049,567. Louis Leonard Larson, Hockessin, and George L. Swartz, Wilmington, Del., to du Pont.
Process of treating bleached paper pulp. No. 2,049,676. George H. Tomlinson, Montreal, Canada.
Size containing casein and saponifiable material used in manufacturing paper. No. 2,049,864. Harold R. Rafton, Andover, Mass., to Raffold Process Corp.
Process of continuously forming a corrugated paper board having a corrugated core and at least one paper liner attached by means of an adhesive consisting of a gelatinous aqueous carrier medium and ungelatinized starch. No. 2,051,025. Jordan V. Bauer, Chicago, to Stein, Hall Mfg. Co., Chicago.

Petroleum and Petroleum Chemicals

Equipment for transportation, storage, and utilization of customer's liquefied petroleum. No. 2,047,953. Paul S. Endacott, Bartlesville, Okla., to Phillips Petroleum Co., Bartlesville, Okla.
Process for controlling the decolorizing of hydrocarbon oils. No. 2,047,985. Horace M. Weir, Phila., to Atlantic Refining, Phila.
Method of reclaiming liquid petroleum hydrocarbon solvent having boiling point not above that of the absorption oil. No. 2,048,140. Paul B. Renfrew and Leona Marsh, Fort Wayne, Ind., to S. F. Bowser and Co., Fort Wayne, Ind.
Process and apparatus for removing hydrogen sulfide from raw gasoline at sub-atmospheric pressure and low temperature. No. 2,048,241. Malcolm P. Youker, Bartlesville, Okla., to Phillips Petroleum Co., Bartlesville, Okla.
Method of separating wax from wax-bearing oils. No. 2,048,244. Ulric B. Bray, Palos Verdes Estates, and Donald E. Carr, Naples, Calif., to Union Oil Co. of Calif., Los Angeles.
Furnace for the pyrolytic treatment of hydrocarbon oils. No. 2,048,351. Carl O. Melberg, Ponca City, Okla., to Continental Oil Co., Ponca City.
Blending mineral oils and residues at 850° F. and under sufficient pressure to prevent separation of light oil components and for time short enough to minimize cracking. No. 2,048,371. Allan Howie Calderwood, Martinez, Calif., to Shell Development Co., San Francisco.
Production of a mineral oil composition made up of liquid oils and waxy hydrocarbons containing a small amount of an ester of an organic carboxylic acid to depress the pour point of mixture and a wax substituted hydroxyaromatic compound. No. 2,048,465. Orland M. Reiff and Darwin E. Badertscher, Woodbury, N. J., to Socony-Vacuum Oil, N. Y. City.
Production of a mineral oil composition of liquid oils, waxy hydrocarbons, and also a small proportion of the phthalic ester of a heavy alkyl substituted phenol to depress the pour point of the oil. No. 2,048,466. Orland M. Reiff and Darwin E. Badertscher, Woodbury, N. J., to Socony Vacuum Oil.
Recovery of high melting point paraffin wax from wax cake containing also oil and low melting point wax by saturating cake with beta, beta dichlor diethyl ether and sweating in the presence of the same compound. No. 2,048,513. James Morris Page, Jr., Casper, Wyo., to Standard Oil Co., Chicago.
New method of petroleum refining. No. 2,048,546. William T. Hancock, Long Beach, Calif.
The process of stabilizing cracked motor fuels by the addition of .001% alpha naphthol and .0005% phenyl beta naphthylamine. No. 2,048,770. Eugene Ayres, Swarthmore, Pa., to Gulf Oil Corp., Pittsburgh.
Process of recovering phenolic bodies in alkali wash liquors used in cracked gasoline treatment. No. 2,048,784. Harry E. Drennan, Bartlesville, Okla., to Phillips Petroleum, Bartlesville.
Production of a composition consisting of calcium carbide sprayed with a petroleum distillate. No. 2,048,962. John B. A. G. Neumann, Maracaibo, Venezuela.
Process of distilling hydrocarbon oil to produce several fractions, including lubricating oils as overhead distillates. No. 2,048,973. Arthur J. Slagter and Charles W. MacKay, Tulsa, Okla., to The Ohio Oil Co., Findlay, Ohio.
A method for the conversion and coking of hydrocarbon oils. No. 2,048,986. Charles H. Angell, Chicago, to Universal Oil Products Co., Chicago.
A method for simultaneously refining gasoline and producing a low pour test lubricating oil by subjecting unrefined gasoline to high temperatures and treating with aluminum chloride. No. 2,048,992. Martin B. Chittick, Chicago, to Pure Oil Co., Chicago.
Production of asphalt and lubricating oils from the liquid residue of the hydrocarbon cracking process by prolonged digestion between 550° F. and 850° F. No. 2,049,000. Roland B. Day, Chicago, to Universal Oil Products Co., Chicago.
Process of extracting hydrocarbon material from coal at high temperature and pressure. No. 2,049,013. Charles D. Lowry, Jr., Chicago, to Universal Oil Products, Chicago.
Process of raising the viscosity index of lubricating oil by treating petroleum lubricating stock with anhydrous aluminum chloride at 425°-500° F. No. 2,049,014. Almer M. McAfee and Lucien O. Crockett, Port Arthur, Tex., by mesne assignments to Gulf Oil Corp., Pittsburgh.
Removal of sulfur and gum forming unsaturated hydrocarbons from cracked petroleum distillates. No. 2,049,016. Jacques C. Morrell, Chicago, by mesne assignments to Universal Oil Products Co., Chicago.
Process of separating naphtha from a mixture containing hydrocarbons, together with non-condensable gas, into debutanized and stabilized fractions. No. 2,049,027. Jackson R. Schonberg and Willard E. Robinson, Westfield, N. J., to Standard Oil Development Co.
Dewaxing petroleum oil by treating with a solvent containing secondary butyl alcohol. No. 2,049,036. Arthur M. Wilson, Cranford, N. J., to Standard Oil Development.
Production of an emulsifiable composition consisting of an emulsifier and a mineral oil desulfurized by destructive, catalytic hydrogenation. No. 2,049,043. Harold S. Birkby, Nutley, N. J., to Standard-I. G.
Precipitation method of separating asphalt and wax from oil. No. 2,049,046. Ulric B. Bray, Palos Verdes Estates, Calif., to Union Oil Co. of Calif., Los Angeles.
Method of dewaxing oils in which mixture of oil and solvent is passed successively through a series of chillers at progressively lower temperatures. No. 2,049,051. William A. Eberle and Louis H. Zepfler, Jersey City, N. J., to Standard Oil Development.
Method of dewaxing hydrocarbon oils involving centrifugal means of separation. No. 2,049,059. Henry Frank Goss and John Opryshek, Baytown, Tex., to Standard Oil Development.
Process of manufacturing high viscosity index lubricating oil having a low pour test and low in residual carbon-forming bodies. No. 2,049,060. Francis X. Govers, Vincennes, Ind., to Indian Refining Co., Lawrenceville, Ill.
Production of motor fuel containing olefine polymers. No. 2,049,062. Frank A. Howard, Elizabeth, N. J., to Standard Oil Development.
Construction of an oil and gas separator. No. 2,049,068. Bernard A. Loupe, Baton Rouge, La., to Standard Oil Development.
Process of treating slip or sludge composed of clay and water to separate solid particles from liquid. No. 2,049,071. David F. McCormick, Ellard, Va., to Kaolin Processes, Inc., Elizabeth, N. J.
Production of lubricants and blending materials by partial hydrogenation of organic esters. No. 2,049,072. Louis A. Mikeska and Luther B. Turner, Elizabeth, N. J., to Standard Oil Development.
A method of removing low boiling constituents from a mixture of hydrocarbon oils. No. 2,049,247. Myron J. Burhard, Ridgewood, N. J., to Socony-Vacuum Oil, N. Y. City.
Method of dewaxing and partially decolorizing petroleum lubricating stock. No. 2,049,277. Claude F. Tears, Warren, Pa., to The Petroleum Processes Corp., Wichita, Kan.
Improved method in refining petroleum distillates by use of an aqueous caustic solution containing lead sulfide, substantially free from dissolved lead compounds and added free sulfur. No. 2,049,423. Ernest S. Brown, Inglewood, and Donald B. Nutt, El Segundo, Calif., to Standard Oil of Calif., San Francisco.
Cracking process in treatment of hydrocarbon oils. No. 2,050,025. Pike H. Sullivan, New Rochelle, and Harold V. Atwell, White Plains, N. Y., to Gasoline Products Co., Newark, N. J.
Production of a hydrocarbon lubricant by subjecting an isolated lubricant body to contact with aluminum hydrate in the absence of aluminum chloride at high temperatures. No. 2,050,139. Ernest Wanamaker and Harry D. Allgeo, Chicago, to Patents Research Corp., Chicago.
Method and apparatus for removing foreign matter from petroleum. No. 2,050,301. Harmon F. Fisher, Long Beach, Calif., to Petroleum Rectifying Co. of Calif., Los Angeles.
Vacuum distillation in separation of higher viscosity lubricating oils from topped crude oil. No. 2,050,329. Stephen S. Johnson, Jr., Short Hills, N. J., to M. W. Kellogg Co., N. Y. City.
Refining process for petroleum oils involving sludge formation and dichloroethyl ether treatment. No. 2,050,345. Leo Liberthson, N. Y. City, to L. Sonneborn Sons, Inc.
Conversion and coking of hydrocarbon oils. No. 2,050,427. Alfred Fisher, Chicago, to Universal Oil Products Co., Chicago.
An apparatus and process employed in the cracking process of hydrocarbon oils. No. 2,050,467. John D. Seguy, Chicago, by mesne assignment to Universal Oil Products Co., Chicago.
Method of separating and purifying constituents of a gas mixture. No. 2,050,511. Lee S. Twomey, Vista, Calif.
Separation of one or more components of an aqueous organic mixture by azeotropic distillation and extraction. No. 2,050,513. Adrianus J. Van Peski, Bussum, and Wilhelm C. Brezesinska, Amsterdam, Netherlands, to Shell Development Co., San Francisco.
Production of gasoline and lubricating oil by process of refining mineral oil involving flow of oil and oxidizing agent through pipe still between 300° C. and 500° C. and subsequent treatment with alkali metal. No. 2,050,772. Justin F. Wait, N. Y. City.
A package for lubricants consisting of a chamber with Cellophane walls, a channel formed of Cellophane in communicable relation to the chamber, and an inflexible nozzle to which the channel is secured. No. 2,050,812. Paul H. Schweitzer, State College, Pa.
Process of producing anti-knock gasoline by treatment of hydrocarbon oils. No. 2,050,816. Le Roy G. Story, Beacon, N. Y., to The Texas Co., N. Y. City.
Process of treating hydrocarbon oils. No. 2,050,847. Percival C. Keith, Jr., Peapack, N. J., to Gasoline Products Co., Newark, N. J.
Process for breaking emulsions of the water-in-oil type. No. 2,050,923. Melvin De Groote and Wilbur C. Adams, St. Louis, and Bernhard Keiser and Arthur F. Wirtel, Webster Groves, Mo., to Tretolite Co., Webster Groves, Mo.
Process of breaking petroleum emulsions of the water-in-oil type. No. 2,050,924; 2,050,925; 2,050,927; 2,050,928; 2,050,929; 2,050,930. Melvin De Groote, St. Louis, Mo., to Tretolite Co., Webster Groves, Mo.
Process of breaking emulsions of the water-in-oil type. No. 2,050,926. Melvin De Groote, St. Louis, and Bernard Keiser, Webster Groves, Mo., to Tretolite Co., Webster Groves, Mo.
A preliminary procedure for conditioning a well by introducing into the producing stratum a hydrophobe solution of a water and oil soluble wetting agent. No. 2,050,931. Melvin De Groote, St. Louis, Mo., to Tretolite Co., Webster Groves, Mo.
Use of emulsified treating medium for increasing productivity of wells. No. 2,050,932 and 2,050,933. Melvin De Groote, St. Louis, Mo., to Tretolite Co., Webster Groves, Mo.
A hydrocarbon raw charging stock cracking process. No. 2,050,986. James A. Wales, Westmount, Quebec, Canada, to McColl-Frontenac Oil Co. Ltd., Montreal, Canada.
Method of producing green bloom lubricating oils by treating residuum from petroleum cracking stills with sulfuric acid and subjecting to vacuum distillation. No. 2,051,255. Donald K. Harger, Hermosa Beach, Calif., to Standard Oil Co. of Calif., San Francisco, Calif.
Oxidation of polyhydric alcohols in the presence of a solid oxidizing agent. No. 2,051,266. Sumner H. McAllister and Martin de Simo, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.
Process and apparatus for heat and cool treatment of hydrocarbon fluids. No. 2,051,325. Malcolm P. Youker, Bartlesville, Okla., to Phillips Petroleum Co., Bartlesville, Okla.
Method and apparatus for treating hot products of hydrocarbon combustion. No. 2,051,335. Jesse A. Guyer, Bartlesville, Okla., to Phillips Petroleum Co., Bartlesville, Okla.
Process of coking hydrocarbon oils involving treatment with molten metal. No. 2,051,354. Donald L. Thomas, N. Y. City, to Gasoline Products Co., Newark, N. J.
Method and apparatus for treating and coking petroleum residues. No. 2,051,462. Charles W. Andrews, Chicago, and Ray S. Petersen, San Antonio, Tex., to Brassert-Tidewater Development Corp., Chicago.

Production of a halogenated organic acid by oxidation of a halogenated ketone at a rate at which undesired disruption of the ketone molecule is substantially avoided by the presence of an effective quantity of an acid-acting hydrolysis inhibitor. No. 2,051,470. Martin de Simo and Clyve C. Allen, Berkeley, Calif., to Shell Development Co., San Francisco.

Production of alkylated phenolic bodies by reacting a tertiary olefine with an aromatic carbocyclic body hydroxylated in the nucleus in the presence of a catalytic amount of a mineral acid condensing agent. No. 2,051,473. Theodore Evans and Karl R. Edlund, Berkeley, Calif., to Shell Development Co., San Francisco.

Production of monoalkylolamine from an alkylene oxide and an excess of aqueous ammonia solution. No. 2,051,486. Carl T. Kautter, Berkeley, Calif., to Shell Development Co., San Francisco.

Cracking process carried out with oils in liquid phase, in absence of excess hydrogen, under a superatmospheric pressure. No. 2,051,612. Albert Loebel, Amsterdam, Netherlands, to Shell Development Co., San Francisco.

An apparatus for vaporizing liquid fuel without cracking, consisting of a plurality of vaporizers. No. 2,051,743. Norman F. Pratt, St. Petersburg, Fla.

A lubricating composition including a mineral oil and a halogenated organic compound. No. 2,051,744. Carl F. Prutton, E. Cleveland, Ohio, by mesne assignment to The Lubri-Zol Development Corp., Cleveland, Ohio.

A process for cracking hydrocarbon oils. No. 2,051,776. Earl Petty, Scarsdale, and Hermann C. Schutt, N. Tarrytown, N. Y., by mesne assignment to Gyro Process Co., Detroit, Mich.

Pigments

Production of composite pigments by combining a plurality of finely sub-divided, water insoluble pigment forming materials with a fused, water soluble, inert, anhydrous melt in which one of the pigment forming materials is soluble, and separating by dissolving the melt in water. No. 2,048,593. Harold Simmons Booth, Cleveland Heights, Ohio.

Production of a pigment consisting of calcium carbonate magnesium basic carbonate. No. 2,049,021. Harold Robert Rafton, Andover, Mass., to Raffold Process Corp.

Cyclic process for reducing tetravalent titanium in solution containing ferric iron, to trivalent titanium. No. 2,049,504. Ignace J. Krchma, Brooklyn, Md., by mesne assignment to du Pont.

Resins, Plastics, etc.

Method of providing a metallic object with an adherent coating of a polymerized, thermoplastic vinyl resin. No. 2,047,957. John Fletcher, Kenmore, N. Y., to Plastergon Wall Board Co., Buffalo.

Process of compounding thermoplastic compositions by use of a thermoplastic organic derivative of cellulose. No. 2,047,967. Henry Jacobsen, now by judicial decree to Henry Jenett, West Englewood, N. J., to Celanese Corp. of America.

Process for compounding thermoplastic compositions, involving the formation of a dispersion by passing a derivative of cellulose and a substance consisting of oils and resins, normally incompatible with this derivative in a liquid medium, through moving abrasive discs. No. 2,047,968. Henry Jacobsen, now by judicial decree to Henry Jenett, Englewood, N. J., to Celanese Corp. of America.

Formation of a plastic product by reducing the moisture content of a cellulose ester material to less than .5%, adding a plasticizer, and colloidizing under heat and pressure. No. 2,048,686. Fred R. Conklin, Kingsport, Tenn., to Eastman Kodak.

Production of resinous products from polyhydric alcohol, polybasic acid, fatty oil acid, and an aliphatic amine. No. 2,048,778. Merlin M. Brubaker, Wilmington, Del., and Raymond E. Thomas, Newburgh, N. Y., to du Pont.

Manufacture of a moulding composition from cellulose and a plasticizer. No. 2,048,779. Amerigo F. Caprio, Newark, N. J., to Celluloid Corp.

Production of an oil soluble resin, solid at ordinary temperatures, and capable of undergoing further condensation on the application of heat. No. 2,049,447. Herbert Honel, Klosterneuburg-Weidling, near Vienna, Austria, to Beck, Koller & Co., Detroit, Mich.

Molded composite article with a resin surface resistant to heat. No. 2,049,878. Carlo Stresino, Milwaukee, Wis., to A. O. Smith Corp., Milwaukee, Wis.

Use of a fluid solution of a translucid thermoplastic and fusible synthetic resin in the making of simulated photographs. No. 2,050,021. Clyde Scott, Newark, N. J.

An apparatus for producing molded articles from resinous substances plasticized by warming and hardened by heat and pressure. No. 2,050,-100. Peter Kopp, Berlin-Friedenau, Germany.

A record having sound grooves made of synthetic resin composition consisting of halogenated phenolic resins, phenol-ketone resins, and a vegetable oil. No. 2,050,366. William H. Moss, London, England, to Celanese Corp. of America, N. Y. City.

Production of a resilient composition by dissolving polymerized vinyl chloride in a plasticizer at a high temperature and treating with actinic radiation. No. 2,050,595. Jacob E. Wolfe, Akron, Ohio, to B. F. Goodrich Co., N. Y. City.

Production of molded articles containing vinyl ester resins by use of a sulfhydryl and a morpholine as anti-oxidants. No. 2,050,843. Isadore M. Jacobsohn, Chicago, to Coe Laboratories, Chicago.

Dispersion of a nonsaponifiable resin of the coumarone indene type, particularly adapted for sizing and waterproofing paper. No. 2,051,409. John A. Kenney, Plainfield, N. J., to The Barrett Co., N. Y. City.

Process of making a dispersion of a hard resin of the coumarone indene type. No. 2,051,410. John A. Kenney, Plainfield, N. J., to The Barrett Co., N. Y. City.

Process of making an oil soluble resin. No. 2,051,765; 2,051,766; 2,051,767; 2,051,768. Mortimer T. Harvey, E. Orange, N. J., to The Harvel Corp., Newark, N. J.

Rubber

Low temperature method of hydrohalogenating rubber, reacting a hydrogen halide and rubber in a solvent solution at a temperature below 5° C. No. 2,047,987. Herbert A. Winkelmann, Chicago, Ill., to Marbo Patents, Inc.

Method of preserving rubber by treatment in the presence of an acidic condensation catalyst and at a temperature above 200° C., with an aromatic amine and an intermediate obtained by the condensation of a ketone and an aromatic amine. No. 2,048,822. Waldo L. Semon, Silver Lake Village, Ohio, to B. F. Goodrich Co., N. Y. City.

Preservation of rubber by treatment with a diaryl p-phenylene diamine derivative. No. 2,048,823. Waldo L. Semon, Silver Lake Village, Ohio, to B. F. Goodrich Co.

Vulcanizing rubber by use of a vulcanization accelerator containing an aromatic acid halide and a mercapto-aryl-thiazole. No. 2,049,229. Robert L. Sibley, Nitro, W. Va., by mesne assignment to Monsanto Chemical, St. Louis.

Use of magnesium oxide powder in addition to an organic accelerator, to prevent blowing of wire insulation rubber compounds during vulcanization in steam. No. 2,049,415. Ernest B. Curtis, Yonkers, N. Y., to United States Rubber Products, Inc., N. Y. City.

Dialysis under hydrostatic pressure used in purification of rubber latex. No. 2,049,828. Henry P. Stevens, London, England, to Rubber Producers Research Assn., London, England.

Preparation of finely divided chlorinated rubber by steam spraying at temperature above boiling point of solvent, in presence of alkaline substances. No. 2,049,943. Karl Bromig, Frankfurt, Germany, to Deutsche Gold- and Silber-Scheideanstalt, Frankfort, Germany.

Vulcanized rubber material coated with a substance containing an alkaline polysulfide and dichloroether. No. 2,049,974. Joseph C. Patrick, Trenton, N. J.

Use of an acetonyl N-N-dialkyl dithiocarbamate in the vulcanization of rubber. No. 2,050,190. Joy G. Lichty, Stow, Ohio, to Wingfoot Corp., Wilmington, Del.

A finely divided solid composition for use in rubber, the particles of which have absorbed a thin film of condensed pine tar oil vapor. No. 2,050,193. Charles R. Park, Silver Lake, Ohio, to Wingfoot Corp., Wilmington, Del.

Vulcanization acceleration obtained by use of a mercapto benzenoid thiazole and an ethylene derivative. No. 2,050,198. Lorin B. Sebrell, Cuyahoga Falls, Ohio, to Wingfoot Corp., Wilmington, Del.

A meltable, wax-like composition product consisting of wax and a compound formed by the decomposition of rubber treated with chlorostannic acid. No. 2,050,209. Samuel D. Gehman, Akron, Ohio, to Wingfoot Corp., Wilmington, Del.

Textile, Rayon

Method and apparatus for producing fibrous or filamentary material. No. 2,048,651. Charles L. Norton, Boston, to M. I. T., Cambridge, Mass.

Purification of cotton linters by digestion under heat and pressure with dilute caustic soda solution containing a sodium salt of a sulfuric acid ester of a saturated, 6-18 carbon atom, aliphatic alcohol. No. 2,048,775. Elmer K. Bolton, Wilmington, Del., to du Pont.

Production of colored effects on materials containing cellulose derivatives. No. 2,048,785. George H. Ellis and Henry C. Olpin, Spondon, England, to Celanese Corp.

Coloration of textile material containing cellulose derivatives by application of dimethoxy anilide and oxy naphthoic acid coupled with a diazotized diamino-diarylamine. No. 2,048,786. George H. Ellis and Ernest W. Kirk, Spondon, England, to Celanese Corp.

Production of dull artificial compositions from viscose using titanium dioxide as the delustering agent. No. 2,048,833. Kurt Witte and Hans Cayser, Rorschach, Switzerland, to Feldmuhle A. G., Rorschach, Switzerland.

Process for bleaching fibrous material employing an oxidizing bath containing a peroxide, and a mixture of the magnesium salts of a high molecular fatty alcohol sulfuric acid ester and of a sulfonic acid of a fatty alcohol. No. 2,048,991. Karl Butz, Chemnitz, and Gustav Deuschle and Gunther Simon, Stuttgart, Germany, to H.Th Bohme Aktiengesellschaft, Chemnitz, Germany.

Process of impregnating woven or knitted cellulose fabrics to prevent creasing and rumpling without destroying their flexibility. No. 2,049,217. Pierre Meunier, Paris, France, to Resines et Vernis Artificiels, Lyon, Rhone, France.

Saponification of cellulose ester fabrics by the action of an alkaline earth compound at high temperatures. No. 2,049,431. Henry Dreyfus, London.

Process of dyeing materials containing cellulose derivatives with an unsulfonated azo dye made with aminonaphthol. No. 2,049,432. George H. Ellis, Henry C. Olpin, and Ernest W. Kirk, Spondon, England, to Celanese Corp. of America, N. Y. City.

Production of a fabric, substantially stabilized against shrinkage and slipping, by impregnation with synthetic resin. No. 2,050,156. Hector C. Borghetty, Jewett City, Conn., to Aspinook Co., Jewett City, Conn.

Increasing tensile strength of cotton by treatment with an organic amine and heat. No. 2,050,196. Lorin B. Sebrell, Silver Lake, Ohio, to Wingfoot Corp., Wilmington, Del.

Preserving the tensile strength of cotton cord by the application of gallic acid. No. 2,050,197. Lorin B. Sebrell, Silver Lake, Ohio, to Wingfoot Corp., Wilmington, Del.

Process of mercerizing cellulose material involving the use of an alkaline solution containing a phenol. No. 2,050,582. Ludwig Orthner, Leverkusen-I. G. Werk, and Werner Siefken, Cologne, Germany, to German I. G., Frankfort, Germany.

Highly concentrated alkaline treatment baths, particularly mercerizing lyes, with a high penetrating power and a good fatting capacity. No. 2,050,969. Richard Hueter, Haus Waldfrieden, Rosslau-Anhalt, Germany, by mesne assignment to "Unichem" Chemikalien Handels A.-G., Zurich, Switzerland.

An apparatus for improved carbonization of cloth. No. 2,050,977. Elery L. Smith, Melrose, Mass., and Harold H. Belcher, Philadelphia, to Philadelphia Drying Machinery Co., Philadelphia.

Preparation of a felted web having an index of compactness of approximately .95-1.4 and containing a major proportion of substantially unreduced purified wood fiber interfelted with harder type wood fiber and then impregnated with a bituminous saturant. No. 2,051,168. Harold W. Greider, Wyo., and George A. Fasold, Cincinnati, Ohio, to The Philip Carey Mfg. Co.

Process of producing a fulled fabric by fulling such a material in the presence of an aqueous solution of a condensation product containing free hydroxyl groups of a polyhydric alcohol and a high molecular compound. No. 2,051,389. Joseph Nuesslein and Conrad Schoeller, Ludwigshafen, Germany, to German I. G., Frankfort, Germany.

Process of removing size from textiles of all kinds by means of pancreatic amylase in the presence of water soluble salts of chromic acid. No. 2,051,507. Wilhelm Wasmund, Darmstadt, Germany, to Rohm and Haas Co., Philadelphia.

Water, Sewage Treatment

Use of hydrazinated chlorinated coal in the treatment of potable and polluted water. No. 2,050,398. Oliver M. Urbain and William R. Stemen, Columbus, Ohio, to Charles H. Lewis, Harpster, Ohio.

Improved Electrolytic Method of Sodium Production

A MODIFIED method for the electrolytic production of the alkali- and alkaline-earth metals, especially metallic sodium has been worked out by I. J. Moltkehansen, of Brussels. Invention consists of a process for the production of these metals by electrolysis of fused salts thereof in which electrodes of a metal other than the metal to be produced are employed. Another feature is the use of diaphragms for the separation of anodic and cathodic products, characterized by the provision in the electrolytic cell of a combination of 2 salts or compounds of the metal to be produced, one of which is initially decomposed by the electrolysis, and the other of which reacts with the initial anodic products to set free inert products and to reconstitute the substance initially decomposed.

According to one part of this invention described in the British Specification, fused sodium hydroxide is electrolyzed in the presence of fused sodamide, by which the water formed according to reactions (1) and (2) below is fixed with liberation of ammonia, according to reaction (3).

$$
\begin{array}{llll}
 & & + & - \\
(1) & NaOH & = Na & + OH \\
(2) & 2OH & = H_2O & + \tfrac{1}{2}O_2 \\
(3) & H_2O + NaNH_2 & = NaOH & + NH_3
\end{array}
$$

Process of electrolyzing caustic soda in the presence of sodamide is claimed to be advantageous in that the melting point of the electrolytic bath is very much lowered and the secondary reaction between sodium and water at the cathode with formation of hydrogen is suppressed, and thus all danger of explosion is avoided. Suppression of the danger of explosion permits the construction of totally enclosed large units with perfect safety. Consumption of current necessary to maintain the bath in a state of fusion is reduced, and the number of kilowatt-hours consumed for each kilog of sodium produced in the metallic state is correspondingly reduced.

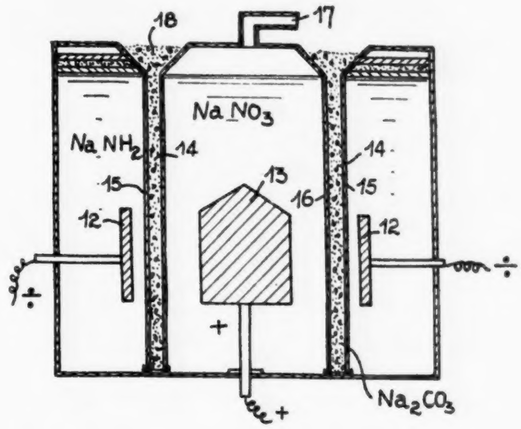
Further, the use of sodamide in the electrolyte causes a cathodic evolution of gas twice as great as that obtained in the electrolysis of caustic soda alone. This increase in volume of the evolved gas favors the elimination as water vapor of part of the water formed during electrolysis, and since water so eliminated does not react with the sodamide, the quantity of the latter required for fixation of water is thus minimized. Caustic soda formed by hydrolysis of the sodamide remains in the electrolyte. This formation takes place in the anode compartment, which is advantageous in the case of the electrolytic operation.

Again, nearly half of the caustic soda to be treated is produced from sodamide, and is consequently absolutely pure. Loss of caustic soda through re-solution and washing in the cleaning of the plant is reduced to a minimum, since the cells may be operated for long periods without interruption.

According to another embodiment of the invention fused sodium nitrate is electrolyzed in the presence of sodium carbonate which is able to fix the oxides of nitrogen liberated at the anode by the electrolysis of the said nitrate, giving in exchange carbon dioxide gas which is inert toward the sodium nitrate. Gaseous products obtained are carbon dioxide and oxygen, which may be recovered, and there is no gas-development at the anode of a damaging or deteriorating nature, as is the case in the electrolysis of fused sodium chloride.

According to the invention sodamide may be added to the cathode compartment, and this further reduces the melting point of the bath, already lowered by the presence of nitrate and nitrite of sodium in the anode compartment. Sodium nitrite is formed by electrolytic reduction, and has a melting point 30° C. lower than the nitrate, while the amide melts at 100° C. lower than the nitrate which again melts 15° C. below the melting point of caustic soda. The amide has the further advantage of preventing any migration of nitrate ions toward the metallic sodium produced at the cathode, since it fixes this gas with formation of free or combined ammonia.

By another embodiment of the invention the electrolysis of sodium nitrate is carried out so as to utilize natural sodium nitrate as the raw material. For this purpose the cathode chamber is charged with fused sodamide, mixed preferably with



a fused neutral body, a good electrical conductor, preferably of a density less than that of metallic sodium and having a high boiling point about or above 250° C. Such bodies are especially, various paraffins and organic products such as naphthoquinoline, chrysene, carbazol, anthrapurpurin, acridine, anthracene, anthraquinone, diphenyl and derivatives thereof, ozokerite or ceresine and other analogous products, rendered electrically conducting by colloidal solution therein of sodamide, graphite or analogous substances.

Cell Construction: The Double Diaphragm

According to a feature of the invention there are used between the anode and cathode compartments double diaphragms, referred to as chemical diaphragms, consisting of 2 ordinary diaphragms containing between them a layer or wall of solid sodium carbonate which prevents the migration of the nitrate ions towards the cathode.

In the cell represented in the diagram are cathodes (12), and anode (13) and diaphragms (14), which are so-called chemical diaphragms consisting of 2 ordinary diaphragms (15) and (16), between which is a layer or wall of sodium carbonate. The anodes and cathodes are preferably made of aluminum or nickel. Electrodes (cathode and/or anode) are employed in the form of a metallic netting which facilitates the operation by permitting an easier renewal of the electrolyte around the electrodes. The catholyte is sodamide: the anolyte is sodium nitrate. Preferably there is added to the catholyte a paraffin rendered electrically conducting, either by the sodamide or by another substance such as graphite, in colloidal solution.

In the example shown the anode compartment is placed between the cathode compartments. Thus it is easy to maintain in the exterior cathode compartments a temperature slightly

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STOCK SIZES AND PHYSICAL DATA

SPECIFICATIONS	SIZE NUMBER							
	0	1	2	3	4	5	6	7
A—Outside Diameter—Inches	¼	½	¾	1	1¼	1½	2	3
B—Inside Diameter—Inches	⅛	⅜	½	¾	⅞	1	1½	2⅜
C—Length—Inches	¼	½	¾	1	1¼	1½	2	3
D—Approximate Number of Rings per Cubic Foot	85,000	10,600	3,140	1,325	678	392	166	49
E—Sq. Feet of Absorption Surface per 1,000 Rings	2.50	10.75	24	43	67	96	172	388
F—Sq. Feet of Absorption Surface per Cubic Foot of Tower Space	212	114	75	57	45	37.5	28.5	19
G—Pounds of Rings per Cubic Foot of Tower Space	46	27	34	27	31	34	27	23
H—Minimum Crushing Strength across Diameter—Lbs	17	13	42	44	89	138	157	236
I—Load on Each Bottom Ring per 10 feet of Tower Height—Lbs. (Dry Rings)	0.25	0.56	1.6	2.25	4.0	6.4	9.0	17.5
J—Per Cent Free Gas Space	55	74	67	74	69	67	74	78
K—Square Feet Absorption Surface per Cubic Foot of Free Gas Space (F ÷ J)	387	155	113	77	65	56	39	25
L—Relative Scrubbing Capacity (F × J)	116	84	50	42	31	25	21	15

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below that in the anode compartment with a minimum loss of heat and under the best conditions for the 2 different operations involved in the 2 compartments, namely, the electrolysis and the secondary reaction respectively. All these products in a fused state are exposed to electrolysis. The decomposition of the sodium nitrate with liberation of metallic sodium at the cathode and formation of nitrate ions (NO_3—) is followed by a secondary reaction whereby the nitrogenous products which penetrate into the chemical diaphragm (14) decompose the sodium carbonate therein contained producing carbon dioxide gas and forming nitrate and nitrite of sodium.

The chemical diaphragm is preferably constructed on the cathode side of an asbestos sheet armed with metallic netting (15) or of a mixture of asbestos fibres and magnesia powder. Sheet is rendered resistant to the attack of nitrous gases which might penetrate so far by migration, through the impregnation of the fibres by the salts or paraffins contained in the cathode chamber.

Recovery of the Gaseous Products

The metallic sodium produced may be withdrawn at the upper part of the cell if lighter than the electrolyte or at the lower part of the cell if heavier than the electrolyte. The gaseous products consist principally of oxides of nitrogen and of carbon dioxide, produced by the part of the oxide of nitrogen on its way towards the cathode, this carbon dioxide being eventually mixed with oxygen. These gaseous products are drawn off at the outlet (17) and transformed to nitric acid by washing and absorption in water. The sodium nitrate is introduced into the anolyte as required, preferably in the fused state, by an opening not shown in the figure, and the sodium carbonate is introduced as required in fine powder into the funnel 18. *The Chemical Trade Journal*, British, Aug. 14th, p126.

Federal Research Subsidy

The "Revenue Act of 1936" may cause more changes in corporate management and fiscal policy than any legislation of this generation. The Act is rather abstruse and a bit ambiguous, but its drastic effect on certain types of basic management decisions may be illustrated by a simple hypothetical case. It may be assumed that the Board of Directors of a corporation has before it the disposition of taxable income for the year ending December 31, 1936, estimated in advance to be $100,000. How should the Board dispose of these earnings?

By paying the $100,000 all out during 1936 in cash dividends, the company's normal income tax would be $13,840, with no surtax on undistributed profits. If the payments are made in cash the $100,000 will be lost to the corporation for its future use. Payment of no dividends, however, would add a surtax on undistributed profits of $17,662.80, bringing the total levy for the year up to $31,502.80, or at the rate of 31.5%.

The Board might feel it advisable to pay only $50,000 in dividends and reduce by $50,000 a current bank loan, but as the government would collect an extra $4939.60 in taxes if the earnings are used to pay indebtedness instead of dividends, it is obvious that the bank would be requested to renew the loan.

If the Corporation suddenly had an unusually favorable opportunity to buy the land and buildings it occupied for $80,000, the directors would discover that the purchase was not necessarily a bargain—the government would collect $12,262.80 as a commission on the transaction in the form of a surtax on the undistributed profits so used.

Likewise, the Board might consider the time appropriate for expansion by installing new machinery or replacing obsolete equipment, budgeting $60,000 of current earnings to be spent during the year for this purpose and paying the balance of $40,000 in dividends. Before signing the contracts they would discover the actual cost of the machinery to be $67,139.60, because the government would impose a levy on this transaction as a surtax on that portion of the earnings not distributed.

A further cost scrutiny shows that for every dollar of current earnings paid for insurance premiums on the life of officers, the Internal Revenue Department would collect approximately 32 cents, such premiums not being deductible as expense in figuring either normal income taxes or surtaxes, when the company is the beneficiary.

Possible Alternatives

If, however, the Board decided to spend its entire anticipated earnings of the year for additional research and development work on its products, and on sales promotion, advertising, or other controllable expenses which by established tax practice need not be capitalized, the corporation would show no taxable profit and therefore would not be subject to either the normal tax or surtax. Yet these earnings would have been reinvested in the business for the future.

The diversion of all anticipated income into deductible expenses is an extreme cited merely for contrast, yet under the "Revenue Act of 1936" the government in effect gives a 32% subsidy to the corporations with large potential profits who utilize their current earnings in this way. Many far-sighted business men will divert more than normal amounts of current earnings to research and to other constructive expenditures so subsidized, rather than adopt the questionable alternative of distributing all these earnings in dividends to avoid the heavy penalty surtax. *Industrial Bulletin*, Arthur D. Little, Inc., August, 1936, No. 115.

Industrial Chemicals

Decolorizing Phosphates with Bichromates

General Chemical has patented a process of employing chromium compounds for decolorizing purposes in the manufacture of alkali phosphates (No. 2,028,632). Rock is treated with sulfuric to obtain a solution of phosphoric containing monocalcium phosphate. The acid solution, after separation from the calcium sulfate and other insoluble salts, is treated with a mother liquor of sodium triphosphate (from a later stage in the process) containing other sodium compounds such as the sulfate in such quantities that the sodium sulfate reacts with the monocalcium phosphate in the acid solution, and precipitates the calcium in the form of calcium sulfate. Solution obtained contains monosodium phosphate, the triphosphate in the solution having been decomposed by the phosphoric acid. After settling and separation of the calcium sulfate sludge, solution is treated with sodium bichromate (usually about 0.4 lb. per ton of solution) to decolorize the organic impurities. Mixture is agitated for several minutes, its color becoming intensively green owing to the formation of chromium phosphate. Clear solution is then neutralized with ash, which converts the free phosphoric into monocalcium phosphate and precipitates the chromium as hydrate. Exact quantity of bichromate to be used is tested as follows: A solution of sodium bichromate (20 grams of the dehydrated salt per liter of water) is added to 1,000 grams of the solution to be treated at ordinary temperatures. Point at which the yellow tint of the bichromate masks the green color of the chromium phosphate indicates a slight excess of bichromate. In practice 80% of the quantity of bichromate found by this test should be used.

Needle-Like Trisodium Phosphate

Victor Chemical has patented (U. S. No. 2,050,249) a process for the manufacture of alkaline trisodium phosphate in the form of needle-like crystals in which a strong solution of caustic soda is added to a strong solution of trisodium phosphate, the former being added in sufficient quantity to cause the trisodium phosphate to separate out of the solution. The needle-like

crystals have an average length of 5½ times the thickness, an alkalinity ratio of 1.07 and a density in bulk of approximately 0.45-0.55 and the formula $9(Na_3PO_4.12H_2O).2NaOH$.

French Sodium Peroxide Modification

A novel method for the production of sodium peroxide (developed by the I. G.) is disclosed in French Patent 790,497. In the oxidation of hydrazobenzene in alcoholic solution in the presence of alkali by means of gaseous oxygen, the alkaline peroxide is precipitated; it is also suggested to use this process for the manufacture of hydrogen peroxide by oxidizing under pressure a solution of hydrazobenzene in benzene. The hydrogen peroxide is separated from the liquid, and after reduction of the azobenzene the cycle is continued. The hydrazobenzene can be replaced by other materials such as leuco-indigo or anthrahydroquinone.

The hydrazobenzene is oxidized in an alcoholic medium in the presence of alkali; the peroxide is separated and the azobenzene reduced again. According to the proportion of water used the sodium peroxide can be obtained in compositions varying between $Na_2O_2.8H_2O$ and Na_2O_2. For the regeneration of the hydrazobenzene, the reduction of the azobenzene is effected with sodium amalgam, exact amount that has been consumed in the oxidation being introduced, and the only other material being the additional amount of water.

The reactions involved are

$$C_6H_5.NH - NH.C_6H_5 + O_2 + 2C_2H_5.ONa = C_6H_5.N = N.C_6H_5 + 2C_2H_5.OH + Na_2O_2.$$

$$C_6H_5.N = N.C_6H_5 + 2C_2H_5.OH + Na_2 = C_6H_5.NH - NH.C_6H_5 + 2C_2H_5.ONa.$$

The process takes place in a cycle. The liquid comes into contact with the oxygen, and then after passage through a trough where the sodium peroxide is deposited, to a reservoir whence it is brought into contact with the sodium amalgam. A special device releases the peroxide from the side walls of the trough.

Blanc Fixe by a New Method

Method for the manufacture of blanc fixe from barytes depends upon the solvent action of certain salts in the melted state on barium sulfate. On adding barytes to a bath of the liquid salt the barium sulfate in the mineral dissolves while the impurities such as silica, chalk and magnesia can be separated. The transparent mass comprising the solution of barium sulfate is subsequently treated with water under such conditions that the salt used as the solvent immediately goes into solution while the barium sulfate settles out in the form of a white mud. Six batches or more can be put through the treatment daily which comprises fusing of the salt, dissolving the barytes, refining the melted mass and, finally, running off the mud. Precipitated blanc fixe is washed and passed through filter presses to yield a paste containing 70 to 75% barium sulfate. It can be transformed into powder by drying and grinding the material coming from the filter presses. Rock salt is recommended as the solvent in the 1st stage, for aside from its solvent action upon barytes and its cheapness, an extremely pure brine can be obtained as a by-product. G. Vie, *L'Industrie Chimique*, July, '36, p.499.

Modification of the Acetic Anhydride Process

Deutsche Gold und Silber Scheidenanhalt, Germany, has patented a modification of the process for the production of acetic anhydride in which chloronaphthalene is used as a high-boiling inert medium.

Butyric Acid from Molasses

A native Porto Rican bacillus has been discovered and isolated by R. Arroyo of the Experimental Station of the University of Porto Rico that removes the difficulties experienced in the past with the end products of fermentation in the production of butyric acid from molasses. Practically pure normal butyric acid is obtained in yields very close to those theoretically possible. Organism is exceptionally vigorous, and has shown itself capable of competing with other organisms that may gain access to the fermenting liquid. It is anærobic, this being a point of great technical importance. Actual yield of practically pure normal butyric lies between 43 and 45%, calculated on the basis of total sugar content of the mash. This amounts to 2.52 to 2.70 lb. of the acid per U. S. gal. of molasses fermented. Butyric, it is stated, could be manufactured by this process at no more than 8 to 10c per lb. *International Sugar Journal.*

Alkali Hydroxides from Chloride

A Norwegian company, The Moss Glasvaerk Co., Ltd., Moss, Norway, produces alkali hydroxides from alkali chloride by heating a mixture of alkali chloride and silica, boric acid, or phosphoric acid to a temperature of 1,000° C. or slightly above. A 10% aqueous solution of the alkali compound formed is then prepared, and treated with an aliquot amount of lime to precipitate the silicic, boric, or phosphoric acid as calcium salt.

Sodium Chlorate Electrolytically from the Chloride

Encouraging results on an electrolytic process for the production of sodium chlorate from sodium chloride are reported by French research workers. Yield is improved by preventing the liberation of chlorine during rapid circulation of the electrolyte by operating under pressure, by utilizing a high anodic current density, and by cooling the liquor. A new plant arrangement gives a pure sodium chlorate containing sodium chloride to the extent of about 0.5% only. There is no liberation of chlorine, and the hydrogen can be collected without danger, since the absence of oxygen removes the risk of explosive mixtures. Sodium chlorate yield is given as 95% when working at 0° C., and with an anodic current density of 20 amps per sq. decimeter in a saturated sodium chloride electrolyte. At 15% C., other conditions being equal, yield is only 88%. Reducing the concentration of the electrolyte also diminishes the yield.

Barium Chloride in Aluminum Production

Barium chloride is employed in a new process for the electrolytic production of aluminum developed by the Compagnie de Produits Chimiques et Electrometallurgiques Alais, Froges et Camargue, at the Saint Jean de Maurienne plant in France. Typical mixture is 23% aluminum fluoride, 17% sodium fluoride, and 60% barium chloride. Advantage of this electrolyte is its low fusion point, a reduction in costs of refractories, crude magnesia bricks, for instance, being employed. The anode alloy contains on the average 33% of copper, and at the works mentioned cells operate with a current of 10,000 amps., an intensity of 40 amps per sq. decimeter, and a voltage of 9. Anode efficiency is 100%, cathode efficiency 97%, and the working temperature 750° C.

Aluminum produced has a purity of 99.995%, while products containing up to 99.9986% of aluminum can be made. It is stated that aluminum refined by this process possesses superior electrical conductivity and corrosion-resistance properties to ordinary pure aluminum. The 99.99% aluminum is specially resistant to acids and certain alkalies, to sea-water, and to atmospheric conditions.

Fine Chemicals

New Coumarin Process

An improved method of manufacturing coumarin by the reaction of omega-dichlor-ortho-cresol carbonate with an excess of acetic anhydride in the presence of an oxide or salts of cobalt, has been patented by L. Givaudan & Cie. in Great Britain.

It has been known in the past that salicylic aldehyde and its acetylated derivatives, namely acetyl salicylic aldehydes, give coumarin when heated with acetic anhydride. However, this reaction is very slow.

When a mixture of omega-dichlor-ortho-cresol carbonate with acetic anhydride is heated in the presence of a salt or oxide of cobalt, acetyl chloride is 1st evolved, the carbonate linkage is broken and an acetyl salicylic aldehyde is formed. Additional acetic anhydride then reacts with the acetyl salicylic aldehyde so formed to cause ring closure, thus resulting in coumarin.

The invention also extends to the preparation of coumarin by heating salicylic aldehyde or its acetylated derivatives, whether obtained as described above or in any other manner, with acetic anhydride in the presence of an oxide or salt of cobalt. In carrying the invention into effect, the reaction may be effected with the use of the oxides or the salts of cobalt in a proportion of 1 to 2% of the weight of the salicylic aldehyde or its acetylated derivatives. *The Givaudanian*, July, '36, p.3.

Tetrachloro Derivatives of Phthalic Acid

Iron is a suitable catalyst for the direct chlorination of phthalic acid to the tetrachloro derivative. To purify the black, crude product, it is mixed in the powdered form with hot water and fairly concentrated alkaline carbonate and the mixture heated on the water bath to dissolve the acid. Ferric hydroxide is removed by filtration and the filtrate extracted 2 or 3 times with hot water, using 8 to 9 liters of water for each kilogram of acid. Solution is gradually acidified with hydrochloric while shaking vigorously, when a fine precipitate of pure tetrachlorophthalic acid containing one molecule of water of crystallization is formed in 90 to 95% yield. Heating just below 100° C. liberates the water of crystallization and water of constitution is split off at 100° C. Salkind & Belikowa, *Journal Prikl. Khim*, 8 (7), p.1210.

New Iodine Process without Incineration

Elimination of the preliminary incineration step in the production of iodine is effected by treatment of the seaweed in the water-laden state with ammonium oxalate and, after several hours at ordinary temperatures, is heated to 50° C. for 2 hours. Liquid is then decanted, sulfuric is added to neutralize the excess of ammonia, and the iodine separated as ammonium iodide.

Coal-Tar Chemicals

Nitrogen Dioxide in Benzene Nitration

Nitration of benzene is normally carried out using a mixture of sulfuric and nitric acids. A paper describes a vapor-phase process using nitrogen dioxide as the nitrating agent at atmospheric pressure and about 310° C. and silica gel as catalyst. Conversion of benzene to nitrobenzene can be brought to 80% but only by use of excess nitrogen dioxide. Nitric oxide formed as a by-product can readily be recovered for re-use as nitrogen dioxide by air oxidation. Ralph H. McKee and Richard H. Wilhelm, *Industrial & Engineering Chemistry*, June, p663.

Benzol from Naphthalene

Benzol can be obtained from naphthalene or its homologues by a catalytic hydrogenation process in which the naphthalene is treated with hydrogen or mixtures containing hydrogen at temperatures ranging between 450 and 500° C. *Chemical Trade Journal*, Apr. 24th, p350.

Plant Operation

Chronic Carbon Tetrachloride Poisoning

Eighteen cases of chronic carbon tetrachloride developed over a period of several years among 20 telephone maintenance engineers stationed where the product was used as a cleansing agent. Symptoms were fatigue, giddiness, sensation of oppression, headache, burning sensation in the eyes, numbness of the limbs, stomach pains, and loss of appetite. Dentition was frequently defective and blood pressure lower than normal. Sowy, *Arch. Gewerbepathol*, '35, 6, No. 2, p157-59.

Plant Equipment

Design of Simple Paddle Agitators

Experiments on the design of simple paddle agitators that have been carried out by White and Summerford, of the Chemical Engineering Dept. of the University of N. Carolina, have shown that, assuming the flat-blade type of agitator has been selected for a given mixing operation, the best paddle design is the following: One with a length slightly less than the tank radius, with a width equal to one-fourth of the paddle length, and placed about one paddle width from the bottom of the tank. It should be rotated at an experimentally determined speed. *Chemical & Metallurgical Engineering*, July, '36, p.370.

Laboratory

British Standards on Solvents and Fats

Two additional British standard specifications for solvents have been announced, one for carbon bisulfide and the other for ethyl lactate. Copies may be obtained from the Publications Dept., British Standards Institution, 28, Victoria st., London, S.W. 1, price 2s. 2d. each.

Copies of the new British Standards Institution's methods for fats analysis, prepared by the International Commission for the Study of Fats (No. 684—1936) are obtainable from the Institution's Publications Dept., 28 Victoria st., London, S. W. 1, price 3s. 8d.

Sulfur Recovery frrom Waste Gases

Experiments in the laboratories of Metallgesellschaft A.G., Frankfort, on the physico-chemical bases of the recovery of sulfur from sulfur dioxide by thermal reduction was discussed by Dr. G. Roesner at the recent meeting of the Verein deutscher Chemiker. Reaction does not take place quantitatively according to the single equation $SO_2 + C = CO_2 + S$, but the following equilibrium reactions are all represented:

(1) $SO_2 + C = CO_2 + S$.	(4) $4CO + 2SO_2 = 4CO_2 + S_2$.
(2) $CO_2 + C = 2CO$.	(5) $2CO + S_2 = 2COS$.
(3) $C + S_2 = CS_2$.	(6) $2COS = CO_2 + CS_2$.

Theoretical calculations would indicate that in the case of reduction with coke at the technically most important temperature range of 1,000° to 1,200° C., the dioxide is entirely converted, and that not less than 25% of sulfur is present in vapor form, other components of the reaction gas being mainly CO and CS_2, together with smaller amounts of CO_2 and COS. Experimental trials, however, have shown that with those gas speeds coming into question technically, equilibrium conditions are not reached; and that conversion by equation (1) takes place considerably more rapidly than the reaction represented by equation (2).

Miscellaneous Booklets

The Nickel Industry in 1935, by President R. C. Stanley, International Nickel, gives a very excellent survey of the uses of nickel and the outstanding developments in the industry in '35.

The U. S. Bureau of Mines reports that the Minerals Yearbook for 1936 is ready.

The Constitution of the Tin-Rich Antimony-Tin Alloys by Prof. D. Hanson, and W. T. Pell-Walpole is the latest release (No. 31) Technical Publications of the International Tin Research and Development Council. Paper will be published in the *Journal of the Institute of Metals*, Vol. LVII, '36.

The Department of Commerce, Bureau of Foreign & Domestic Commerce, has published a "Check Sheet-Introduction of New Consumer Products," obtainable at 5c per copy from the Supt. of Documents, Washington.

The Pennsylvania Department of Labor, Bureau of Industrial Relations has published a Special Bulletin, No. 43, "A Preliminary Report of the Dermatological and Systemic Effects of Exposure to Hexachloro-Naphthalene and Chloro-DiPhenyl."

Another publication of the International Tin Committee deals with "Opacifiers in Wet and Dry Enamels."

Bulk Packaging, Handling, Shipping

Denies Plea for Retention of Emergency Rates

A plea by major railroads for authority to make permanent emergency freight surcharges slated to expire Dec. 31st next, was denied on Aug. 3rd by the I. C. C. without comment. Carriers' petition was filed July 27th last with the declaration that the emergency rates "are just and reasonable, and industry and traffic can bear them without harm."

The roads are faced with 2 alternatives if they are determined to press their fight for permanent rates in these brackets: (1) They may petition the I. C. C. for a rehearing of their plea; (2) the individual carriers may file individually proposed surcharges in line with the emergency rates now in effect. The second course at the moment seems more probable. Emergency rates in question became effective in '31 after a bitter fight.

New Rules for Shipment of Alcohol in Bond

Manhole covers of all tanks used for alcohol shipped in bond must be locked, Bureau of Internal Revenue rules in T. D. 4675. Covers are required to be fitted for locking with a straight lock. Shipper must furnish locks; the government the seals. A government officer will do the locking and sealing, retain the key, and forward it to the officer in charge of the warehouse or plant to which the alcohol is being shipped.

A A C Wins in Suit for Lower Freight Rates

The American Agricultural Chemical Co. has won its case against Chesapeake and Ohio and the Southern Railroad for cheaper freight rates on sulfuric shipped from Alexandria to Covington, via Charlottesville, Virginia, when the State Corporation Commission ordered on Aug. 20th a maximum rate of 13c to apply. Order held that the present rate was "excessive." Case was heard on Mar. 3rd.

Rauh Attacks Freight Rates

Fertilizer carload freight rates from Indianapolis, to destinations in Iowa, Michigan, Minnesota, and Wisconsin are attacked in a complaint filed with the I. C. C. by E. Rauh & Sons Fertilizer Co., Indianapolis.

New Barrel Rack Marketed

A steel rack that permits one man to place a barrel or drum 24 inches above the floor for draining purposes has been announced by the Barrett-Cravens Co., 3255 W. 30th st., Chicago. This rack, intended for either 500 or 750 lb. containers, is available with or without casters. In the design of the rack is incorporated a rocker arc and an automatic floor lock.

Shipment of Dangerous Articles

The I. C. C. Safety Bureau has recommended to the Commission that inflammables, explosives or other dangerous articles should not be transported in cars equipped with archbar trucks.

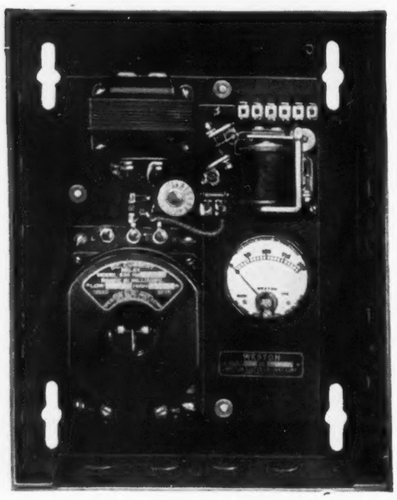
The Largest Single Cause of Accidents

Most important types of compensable accidents in the chemical industry, according to reports, are "handling objects" and "harmful substances" which account for 40% of all types.

New Equipment

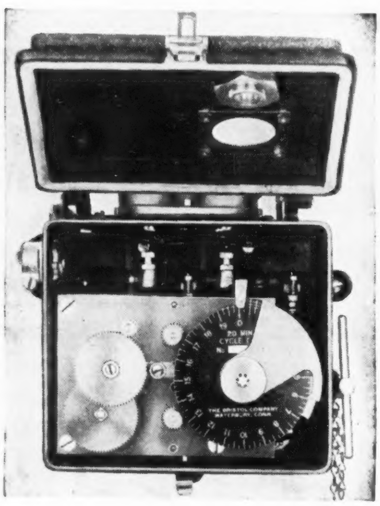
Photo-Electric Control Unit QC 380

A new photo-electric control unit in which sensitivity and operating speed have been doubled, and which is said to be highly dependable even under difficult service conditions, has been introduced by a large New Jersey manufacturer of electrical instruments. It is applicable to a wide range of industrial control purposes in which interruption of a light beam conveniently provides the initial impulse for opening or closing an electrical circuit, such as counting, sorting and weighing devices, automatic processing control, safety cut-offs, alarm warnings and the like.



Process Cycle Controller QC 381

One of the large instrument makers has developed a new process cycle controller to fulfill the many requirements, particularly in the rubber and molded plastics industries, where a variable speed controller is required. This instrument is suitable for automatically controlling any cycle operation which operates on a cycle that must be changed from time to time. It is equipped with one cam operating one or 2 patented, leakless, 3-way pilot valves, as required. by the process. The cam is readily adjustable to carry out any desired time cycle, regardless of duration, within the range of the controller cam.



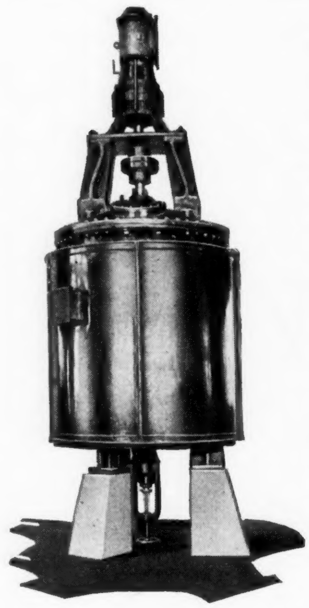
A novel 2-speed cam operating mechanism makes possible a multiplicity of speeds obtainable with but a single cam. The variable speed mechanism employed involves no gear shifts, governors, springs, or escapements. It is extremely simple in construction.

2-Stage Compressors QC 382

A new development in 3- and 6-cylinder vertical angle 2-stage compressors is now being offered. A line of compact, self-contained units with capacities ranging from 142 to 445 cu. ft. per minute has been developed. The 3-cylinder unit has 2 low-pressure cylinders set opposite each other at an angle, with a high-pressure cylinder set vertically between them. The 6-cylinder unit is set up in the same manner, with 2 cylinders side by side in each position.

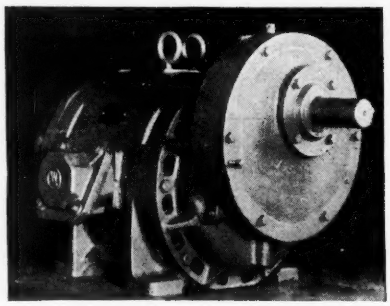
New Line of Kettles QC 383

One of the large manufacturers of heavy equipment for the chemical and process industries has recently announced a new line of kettles, the kettle proper being cast of ordinary gray iron or chemical iron, or of alloys of various types to fit special corrosive operating conditions often found in the processing of materials. These kettles are electrically heated, and are equipped with powerful motor drives. To meet special conditions a wide choice of stirrers is offered by the manufacturer. For those who prefer the kettles are also built in belt driven types. A wide choice of sizes are available, ranging from 50 to 1000 gal. capacity. Manufacturer claims that a number of really worth while operating economies are effected through the installation of these kettles and that the equipment is particularly rugged, and will stand heavy and continuous usage.



Explosion-Proof Gearmotors QC 384

A new line of single reduction explosion-proof gearmotors ranging in size from 1½ to 75 h.p. have been announced. For application in Class 1, Group D hazardous locations where speed reduction is required, these gearmotors have many uses because of their compact design and high efficiency. They are inspected and approved by the National Board of Fire Underwriters for use in hazardous atmospheres containing gasoline vapors and other gases or vapors having equivalent or less hazard such as petroleum products, ethyl alcohol, methyl alcohol, acetone, and lacquers, solvent vapors. Also, they are for use in dry-cleaning and dry-dyeing plants, pyroxylin plastic manufacturing plants, spray painting establishments, gas plants, varnish manufacturing plants and other applications involving similar hazardous processes.



Revolutionary Fire-Fighting Method QC 385

An entirely new method, mechanical rather than chemical, of making foam for fighting flammable liquid fires and suitable for use with long or short lines of ¾" to 2½" hose has been announced.

Chemical Industries,
P.O. Box 1405, New Haven, Conn.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 380   QC 383
" 381   " 384
" 382   " 385

Name..
Title.................... Company....................
Address..

Booklets & Catalogs

Chemicals

A988. American Cyanamid. American Hortigraphs, published every 2 months, is a most complete survey of fertilizer developments the world over.

A989. American Potash & Chemical Corp. A new booklet, published by the company, tells the historical development of the plant at Searles Lake, Calif., where today potash, borax, soda carbonate, soda sulfate, etc., are manufactured in large quantity by the Trona process.

A990. Bakelite Corp., N. Y. City. The 7th edition of "Bakelite Molded" a 47 page booklet describes the complete Bakelite line of molded products, uses, etc.

A991. Bakelite Corporation, N. Y. City. The July "Bakelite Review" contains illustrations and descriptions of some versatile practical applications of bakelite products.

A992. Commercial Solvents Corp., Terre Haute, Ind. Brief and readable booklet on the importance of ethyl acetate as a solvent and synergist, in the manufacturing of lacquers, rayon, plastics, and many other industrial products.

A993. du Pont. "Modern Metal Finishing" is the title of a new publication issued by the R. & H. Chemical Dept. of du Pont, containing illustrated articles of special interest to electroplaters and metal manufacturers.

A994. Flexrock Company, Philadelphia. Folder describing Ruggedwear Resurfacer, a firm, tough, rugged wearing surface, and its applications.

A995. Fritzsche Brothers, N. Y. City. August price list.

A996. General Plastics, Inc., N. Tonawanda, N. Y. "Durez Plastics News," monthly publication, illustrates and describes unusual and practical uses of Durez plastics.

A997. Givaudan-Delawanna Inc., Industrial Aromatic Division, N. Y. City. "Givaudanian," the company's bimonthly publication, describes kerozone, a compound with an ozone-like odor used to impart a pleasant smell to kerosene base fly sprays, dry cleaning fluids, polishes, etc. Another substance mentioned is B 7183, a deodorant which kills the phenolic odor of enamels based on phenolic type synthetic resins.

A998. Hercules Powder Co., Wilmington, Del. July-August issue of "The Hercules Mixer" contains profusely illustrated articles and new items about the Hercules plant and organization.

A999. E. F. Houghton & Co., Philadelphia. Attractively illustrated booklet showing graphically the findings of Houghton's research staff about methods of improving industrial leathers and various applications.

B1. Innis, Speiden & Co., N. Y. City. The August issue of "ISCO NEWS" contains a bulletin of worthwhile hints and information for buyers of chemicals and allied lines.

B2. Koppers Products Co., Pittsburgh. A 12-page folder on Koppax Black Paint, describing its method of use on all metal surfaces, especially where exposed to corrosive agents.

B3. Magnus, Mabee & Reynard, N. Y. City. July-August 1936 catalog and price list.

B4. Mallinckrodt. August price list.

B5. Merck. August price list.

B6. National Aniline and Chemical Co., N. Y. City. "Dyestuffs," published quarterly, includes in the July issue articles by Dr. O. M. Morgan on "Naccolene F the Revolutionary Dry Cleaner," "Screen Printing," by Pieter Mijer, "Dyeing of Cotton and Rayon to be Rubberized," by W. A. Holst, Jr., besides a section dealing with 1936 fall colors for women's gloves.

B7. Parker Rust-Proof Co., Detroit, Mich. "The Parkerizer" tells of the extensive industrial use of Parker Processes for the rust prevention of iron and steel products, Parkerizing for rust proof finish of mechanical parts, Bonderizing for rust resistant base for paint on sheet steel, and the latest development, Bonderite "Z" as a corrosion-preventing and paint-holding treatment for zinc surfaces.

B8. Parker Rust-Proof Co., Detroit, Mich. New booklet describes Bonderite "Z," a process for stabilizing paint finishes on zinc die castings and other zinc surfaces.

B9. Philadelphia Quartz Co., Philadelphia. "Silicate P's & Q's" describes a new viscometer, manufactured by Industro-Scientific Co., and designed by Warren P. Valentine of that concern, known as the P. Q. concentric cup viscometer for general use and of special importance in assisting in the control of silicates of soda.

B10. Rolls Chemical Co., Buffalo, N. Y. Booklet entitled "Retorts" includes a representative list of the standard products distributed by the Rolls Chemical Co.

B11. Royce Chemical Co., Carlton Hill, N. J. This maker of textile chemical specialties has prepared 5 instructive booklets. They are: Wet Processing of Knitted Fabrics; Surfacing that Sells Cotton Fabrics; Royce Brings You Finishes for Silk; Synthetic Fibres Sell by Their Finishes; and Printing under Modern Methods.

B12. Ruhm Phosphate and Chemical Co., Mt. Pleasant, Tenn. Descriptive folder dealing with agricultural importance of lime phosphate.

B13. E. M. Sergeant Pulp and Chemical Co., N. Y. City. Summer 1936 list of industrial chemicals and raw materials.

B14. Thomas-Hayward Chemical Co., Kansas City, Mo. "The Test Tube" published by the company includes "Chemical Prophecies" predicting the market changes of a few chemicals, and also a list of the Thomas-Hayward principals and their products.

B15. Wishnick-Tumpeer, Inc. Handy booklet presents in convenient reference form information on properties, specifications, applications, and other technical data concerning WITCO products, which include chemicals, oils, and pigments.

Equipment

B16. Paul O. Abbe Inc., Little Falls, N. J. New illustrated Catalog "Q" describes line of cutters, granulators, and pulverizers.

B17. American Rolling Mill Co., Middletown, Ohio. Folder describes twelve different types of stainless steels, their characteristics, and applications.

B18. The Bristol Co., Waterbury, Conn. Bulletin No. 447 describes a new cycle controller, Model 6088V, with adjustable features suitable for use in the rubber and molded plastic industries where variable speed controllers are required.

B19. Climax Molybdenum Co., N. Y. City. "The Moly Matrix," the company's monthly bulletin, tells about the importance of molybdenum steels in modern aircraft engines.

B20. DeVilbiss Co., Toledo, Ohio. New catalog, "IB," covers complete line of industrial spray-finishing equipment, including information regarding Spray Guns, Air Compressors, Air and Fluid Hose, Exhaust Systems, Spray Booths, Exhaust Fans, and other equipment, as well as helpful information and interesting tables to aid the finisher in the proper association of equipment with materials and finishing operations.

B21. Foxboro Co., Foxboro, Mass. L. K. Spink has revised the company's edition of the "Handbook of Steam Flow Measurement," a new and improved standard reference manual on the subject, including 50 charts and tables, specific directions for test routine backed up by understandable discussion of the theory, the accuracy to be expected, and the limitations to be considered, also data given for measurements under widely fluctuating pressure conditions with tables of coefficients to simplify the necessary calculations.

B22. Foxboro Co., Foxboro, Mass. Principles, operating details, and methods of the application of the Stabilog Potentiometer Control Pyrometer, besides information about related equipment for automotive temperature control, are described in Bulletin 194-1.

B23. General Electric Co., Schenectady, N. Y. Leaflet gives detailed description of construction, operation, and installation of Manual Motor-Starting Switches CR 1062.

B24. General Electric Co., Schenectady, N. Y. Folder shows examples of power reduction costs in various plants by use of G-E Pyranol Capacitors.

B25. ILG Electric Ventilating Co., Chicago. Catalog FB-45 contains complete specifications on Ilg self-cooled motor propeller fans and Ilg Universal blowers.

B26. H. M. Harper Co., Chicago. New, 1936 catalog listing several thousand items, bolts, nuts, screws, washers, and accessories in brass, bronze, everdur, Monel metal, and stainless steel.

B27. C. O. Jelliff Mfg. Corp., Southport, Conn. An illustrated folder giving descriptions and price lists of wire dipping baskets which are obtainable in fourteen standard designs or can be manufactured to meet individual specifications. This folder, entitled "Dipping Baskets" also includes information on the corrosion of some commonly used metals and alloys.

B28. Lewis-Shepard Co., Materials Handling Equipment Engineers, Watertown, Mass. New, fully illustrated circular, No. 220, describing easy-rolling floor trucks for factory and warehouse, used extensively by manufacturers and distributors for inferior transportation of every type of product.

B29. Link-Belt Co., Chicago. Illustrated leaflet showing new Link-Belt crawler shovel with Speed-O-Matic control, eliminating fatigue of the operator, much faster to operate, and having greater output.

B30. Link-Belt Co., Chicago. Mechanically cleaned bar screens for sewerage treatment plants are described in Folder No. 1587 which contains installation photographs, mechanical drawings of typical arrangements, capacity data, and other information of interest to sewerage plant engineers and operators.

B31. The Milburn Co., makers of Ply Protective Products for the treatment of Industrial Dermatitis (skin affections) have now in print a 16-page booklet with 8 pages of illustrations describing and discussing Industrial dermatitis in American industry.

B32. Miller Products Co., N. Y. City. Trade Catalog No. 836 shows a complete line of rubber gloves, aprons, boots, hard rubber buckets, pitchers, dippers, dipping baskets, protective apparel, and safety devices.

B33. Patterson Foundry and Machine Co., East Liverpool, Ohio. Leaflet containing description of new Patterson Mill drive with magnetic brake and inching device.

B34. Pulmosan Safety Equipment Corp., Brooklyn, N. Y. Folder and leaflet give description and prices of Pulmosan respirators for industrial workers' protection.

B35. Pyrene Mfg. Co., Newark, N. J. Booklet describes revolutionary method of fire fighting.

B36. Republic Flow Meters Co., 2240 Diversey Pkwy., Chicago. Data Book No. 403 contains illustrations of the Republic carbon dioxide meters, with complete specifications regarding their construction, principle of operation, and application.

B37. Republican Steel Corp., Cleveland. "Toncan Topics," the corporation's monthly, four page, illustrated publication, shows various uses of Toncan Iron and gives information about Toncan Iron in a question and answer column.

B38. Surface Combustion, Toledo, Ohio. Illustrated folder describes SC Gas-Fired Muffle Type Clean Hardening Furnaces for hardening small parts, such as leaf springs for motor cars; and a SC D-X Gas Preparation Unit and Clean Hardening Furnace used in the heat treating of rear axle shafts for automobiles.

B39. Wheelco Instruments Co., 1112 Milwaukee Instruments Co., Chicago. Wheelco Co. technical engineers have prepared a series of bulletins presenting an interesting and informative detailed analysis of their recently developed "radio principle" type of pyrometric control instruments which provide a new solution to heat control problems.

B40. Worthington Pump and Machinery. Horizontal duplex direct-acting underwriter fire pumps characterized by rust-proof moving parts, large water passage, dependability, quality materials, large valve areas, unrestricted steam passages, and no water hammer, listed as Type DF.

B41. Worthington Pump and Machinery. Horizontal duplex piston pumps, Type TB, turret type, for handling liquids at pressures up to 200 lb. per sq. inch.

Packaging

B42. Phoenix Metal Cap Co., Chicago. "Phoenix African Flame," an interesting and artistically illustrated magazine, subtly calls attention to the diverse uses of Phoenix metal caps while entertaining the reader with tales of Africa.

Chemical Industries,
P.O. Box 1405,
New Haven, Conn.

I would like to receive the following booklets; specify by number: ....

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Scouring Powders—

Their Manufacture and Uses

By Benjamin Levitt

SCOURING powders originated when the housewife first took a little ashes or clean sand with which to cleanse a burnt pot.

Since then, the industry has grown to a production of approximately 166 million pounds for the year 1933. The latter is two million pounds over 1931 production, thus showing the ever increasing popularity of these products. These figures include only cleansers and scouring powders which contain soap.

Scouring powders may be placed in two categories. First, those consisting of a mixture of alkalies, soap and an abrasive; and second, those which are entirely water-soluble.

Abrasive Powders

The common household cleansers belong to the first class. Their composition depends partly on the whims of the individual manufacturer, his proximity to the supply of silica, and also on the proposed selling price. The most expensive ingredient is soap.

A product sold in 14 oz. cans, three for 11 cents, has the following composition:

Moisture	0.82%
Soap	1.17
Soda Ash	2.39
Mineral	95.35

This product contains powdered silica that is dark in color, and therefore is cheaper than the pure white material.

To make this, it is best to use Federal Specification Soap Powder, and silica of about 140 mesh. A finer mesh, say 200, would be preferable, but would increase the cost.

Manufacture

Mix 7% soap powder, with 93% powdered silica, either by hand, with a hoe, or on a large scale, the materials being charged into an amalgamator (a horizontal trough-like mixer with propellor blades).

By using soap powder, in which the particles of soap are already blended with soda ash, immediate solution takes place when the product is used, and so precludes any possibility of soap specks remaining on the surface being cleaned.

A good cleanser, which has enjoyed a wide market, has the following composition:

Moisture	15.88%
Silica	66.70
Soda Ash	7.84
Trisodium Phosphate (dry)	5.13
Soap	3.86

It is produced as described above, by mixing 25% soap powder, 10% trisodium phosphate (commercial grade, containing 12 mols. water) and 65% silica.

Ground feldspar, 200 mesh, makes a very fine abrasive for general household use. Feldspar is not as hard as quartz and therefore makes a more desirable product. The powder containing trisodium is preferable as a paint cleaner, and for its emulsifying power with neutral oils or fats of the kitchen.

Besides household uses of scouring powders, considerable bulk is used in office buildings, factories, and by public service companies for general maintenance. For example, the General Motors Corp. specifies the following composition for scrubbing floors, marble, tile, painted walls, and for cleaning toilets:

Volcanic ash 85%, sodium carbonate 10%, soap 5%. Fineness—not more than 5% shall be retained on a 20 mesh screen, 70% shall pass through a 60 mesh screen, and 25% shall be retained on 100 mesh.

Federal Spec. P. P. 596—scouring powder for highly polished glass—moisture under 4%; alkali calculated as sodium carbonate not over 5%; anhydrous soap not less than 4%; insoluble siliceous matter 85-90%. The siliceous matter shall pass through No. 100 sieve, and not over 5% shall be retained on the 200 mesh sieve.

Mix 5% of 90% anhydrous powdered soap, or the equivalent of a soap powder containing the requisite amount of soap and alkali, with 90% of 200 mesh silica. This is practically the same product as sold in grocery stores, with a 200 mesh feldspar, and which the manufacturers claim "hasn't scratched yet."

Powdered Hand Soap

Fed. Spec. P.D. 221 for powdered hand soap for mechanics' use is as follows: Volatile matter, not over 5%; alkaline salts calculated as sodium carbonate, not less than 2% nor more than 5%; anhydrous soap, not less than 17%; insoluble siliceous matter, not less than 60% nor more than 76%. Fineness as follows:

Retained on 60 mesh screen	maximum 5%
Retained on 100 mesh screen	maximum 30%
Retained on 200 mesh screen	maximum 60%

It shall contain no rosin or sugar.

Manufacture

The above may be produced by mixing 5% soda ash, 20% of a low titre 88% powdered soap, and 75% pumicite or a mixture of pumicite and ground silica.

Second Class, Non-Abrasive Powders

In the second class, we find mixtures of soda ash and bicarbonate, also those containing soda ash with various amounts of caustic soda.

The latter are used as detergents and alkalizers in laundries, dairies, textile mills and tanneries.

The modified sodas otherwise known as neutral sodas, are marketed in the following strengths:

Bicarbonate of soda	27,	50,	64%
Sodium Carbonate	60,	37,	27%

The balance is water of crystallization. These may be mixed with borax or trisodium phosphate for retail packaging.

A very popular powder in this class consists entirely of trisodium phosphate without any admixture.

A product which has been found to be a very effective garage floor cleaner consists of 12% low titre soap and 88% sodium metasilicate.

For cleaning paint surfaces the General Motors Corp. specifies:

Trisodium phosphate	85%
Soap	10
Caustic soda	5

This is to be used for painted walls which are very dirty, as a substitute for painting.

It is evident from the above that the manufacturer has wide latitude in the formulation of these products, but in every case due consideration should be given to the purpose for which the product is intended.

"Helping the Manufacturer's Salesman Help You"

By Simon S. Selig

President, The Selig Company

IT is pretty much of a certainty that a mother best understands her own youngster; that an inventor can best visualize the performance of his brain child; and by the same token, that the manufacturer knows best what his product is intended to do and the methods and conditions under which it will most favorably fulfill its mission.

Therefore, it is just a matter of horse sense that once a jobber is "sold" on a product as being desirable to his line, that he acquire and utilize every iota of information procurable from the manufacturer. There are several essential factors to the successful launching of any article—its ability to give a satisfactory performance, a thorough knowledge of its properties, and the faculty for "getting across" these attributes to the prospect. So, from these premises we figure that getting right under the wing of the manufacturer and letting him coach our salesman along the specific lines best suited to his product, is the quickest and surest way to establish something new.

In handling one's own sales force, considerable tact must be used. First, we must impress our salesmen as a group that the line in question fills a desired need, rounding out, or completing, the service we may render our present customers. They must also be impressed with the fact that it is a profitable line.

Most salesmen dislike working with factory men because they claim it takes up unnecessary time; or, they claim they can pick it up by themselves; or, their customers do not like to be high pressured by two salesmen at a time; or, the factory man is likely to say or do something to ruin the salesman's prospects with his customer. The factory man, then, must be given the privilege of discussing the matter with each salesman individually if necessary, to sell the salesman on the idea.

We must lay our cards on the table for the factory man, so to speak, thoroughly explaining our method of doing business, stating our policies and giving him such necessary information that he may fit his selling tactics and policies to ours, and thus preclude any possible friction or misunderstanding between our company and the customer.

Therefore, we arrange for a sales meeting between the manufacturer's representative and as many of our salesmen as it is practical to call into the office, and after a session requiring one or more days, our men are well schooled in every aspect of the article's use and qualities, and in turn every possible question, doubt, or sales resistance argument that could possibly arise, has been ironed out in their minds by the person best qualified—the manufacturer's representative. By this time the salesman has been so thoroughly "sold" that his enthusiasm is at the right pitch to consummate sales. And I might add, that it takes a product that is "demonstration proof" and a manufacturer's representative that knows his wares, to stand up under the fire of critical comment that a number of wise salesmen can promote.

To prove that "it can be done" the representative then goes out into the city with some of our men and puts theory into practice by contacting customers. For those salesmen who are unable to attend the general meeting, we arrange for the manufacturer's representative to meet them somewhere in their respective territories, and after putting them through the same training, accompany them on calls to customers.

There must be a sincere spirit of mutual co-operation between manufacturer and jobber to get the greatest yield out of the product, and if it is a "natural" it will prove its worth with repeat orders.

Proper supply of advertising is an important feature. Most companies with a worthwhile product are equipped to supply us with literature and illustrations and other media to enable us to launch the product with the adequate amount of ballyhoo, and after these preliminaries, we travel under our own steam.

On our part, we must grant the manufacturer full opportunity to develop in the minds of our salesmen the sales possibilities of his product, for we consider that the laying of a foundation is the answer to the soundness of the structure, and having the salesman thoroughly "sold" and trained is the first step toward selling the customer. And on the other hand, we ask that the manufacturer's representative conform his sales tactics, in his actual contacts with our customers, to our own established policies. This latter is most important for it is entirely possible that the intrusion of a policy foreign to our customary practices, could easily disrupt and dissatisfy accounts.

In other words, the fitting of the above two factors—one of which comes within the province of the manufacturer, and the other within the province of the jobber—one to the other, perfects the harmonious whole.

Therefore, after tactfully handling our own salesmen and pointing out to them the decided personal profits, as well as company profits, and having treated the factory representative as I have briefly outlined, we will surely be "helping the manufacturer's salesman help us"—to more profits.

Paper delivered before the National Sanitary Supply Ass'n.

Chemical Specialty Formulas

Their Selection, Evaluation and Interpretation

By Charles F. Mason

SMALLER companies which produce chemical specialties are usually organizations headed by high-pressure business men whose principal duties are selling the finished goods. The plant manager is kept busy interviewing salesmen about raw materials, containers, etc.; checking credit risks, and watching material and operating costs.

This throws the largest responsibility for processing, packaging and shipping upon a non-technical plant foreman and unskilled helpers whose greatest boast is that of former employment in the plant of a large company whose processes involve chemical and physical transformations. Sometimes a small room is reserved for what is considered a laboratory, but it often is more a store room for clothing, commercial samples and the simplest kinds of scientific apparatus like scales, thermometers and hydrometers. But all in the organization are eager to improve existing products and add new ones.

Popular Conception of Formulas

This urge manifests itself in constant seeking for processing information or formulas. Their notion of a formula is a list of materials with the proportions and a few instructions about compounding. A broader point of view of a formula, is that it is a chemical process which must be conducted under identical conditions of temperature, time limits, agitation, grinding, etc., for each batch and even then variations in the uniformity of the materials (especially natural ones) will show in the finished product. You cannot take all kinds of liberties with a formula which has been wisely chosen and tested out, such liberties as cheaper raw materials, new colors, or strange deodorants with no respect for chemical specifications which are altered thereby.

Large chemical companies, importers of gums, resins, drugs, etc., are deluged by letters and personal calls from individuals and corporations who even send samples of the product which they are about to manufacture or wish to duplicate with requests for free samples of raw materials and formulas from which they can choose one which meets their tastes. This has been brought about largely by dealers, who publish in their booklets a few formulas for demonstration of properties of a product, and through ignorance of the fact that chemists like physicians, dentists, and other professional men are conducting private practice to solve such problems for a fee.

One interesting example is that of a mixture of natural resins in a solvent which upon chemical analysis could not be readily duplicated without building up from basic materials many trial batches. It was duplicated in this manner in all respects even to cost by a chemist who, discouraged by attempts of others to steal it, decided to manufacture and sell by himself. In demonstrating it to a prospective purchaser two components were disclosed. Although the demonstration was satisfactory a sale was not made due to the fact that the purchaser thought that he had the secret. He went to producers of pebble mills, colloid mills, etc., with the proposition that if they would grind a satisfactory sample with the other unknown component and the mixture of pigment and castor oil, equipment would be purchased from the one submitting the best sample. Confident that the other substance was rosin each submitted a sample of the correct consistency, but the cost was increased four times above selling cost of the product to be duplicated and the solubility in other solvents, where it was to be used, had no resemblance to that desired. Although the salesmen of this equipment were college trained men, they should know better and to this day claim that they duplicated the product perfectly.

This condition is increasing as our chemical industry grows and new opportunities for specialties are presented. Therefore a description of the methods which a technical man would use in choosing a formula from a list of at least twenty for experimentation to fit a specific purpose are outlined below.

1. Calculate cost per pound or gallon for all formulas available.
2. Choose at least three which involve the fewest number of components and can be made at the lowest cost.
3. Investigate the source of raw materials in those formulas chosen in respect to steady supply, grades—domestic or imported, and fluctuations of price.
4. Investigate whether or not existing plant equipment can be used and if it is to be purchased learn where and whether or not a trial batch can be run before purchasing.
5. Make small experimental batches of at least twenty pounds or two gallons under conditions which can be duplicated in plant equipment recording all variables like quantities, temperatures and time intervals.
6. If the quality of the product is satisfactory investigate shipping containers for corrosion and effects of standing upon store shelves, also toxicity of components for the safety of producer and user.

Needless Formula Changing

When one product has been decided upon no parts of it can be changed, even the color, odor or grades of raw materials, because the customers are keen to observe such, and complaints will pour in about the product not being uniform. In case some customers say that they want more body to a viscous solution the content of solids must be increased and material marked special must be sent out to him upon all future shipments. Catering to customers and salesmen in this way is not always profitable because if continued too far will result in a different formula to each customer.

In case the above commandments are adhered to strictly the experimenter will acquire an intimate knowledge of the properties of all materials used, their behavior during processing and the properties of the finished product. Moreover time will be saved if some laboratory tests are made by an outside laboratory to see if the product complies with specifications of government bureaus, trade associations, etc., and how it would behave if shipped from a winter zone through the tropics and into a south temperate one. This information would give some clue to troubles encountered in winter.

On the next page four formulas are listed and were taken at random from Techno-Chemical Receipt Book by W. T. Brannt, and W. H. Wahl, Henley's Twentieth Century Book of Formulae and Scientific American Cyclopedia of Formulae.

1. Size

Glue	600 parts
Gypsum	500 "
Chloride of Lime	5 "
Glycerine	5000 "
Spermaceti	500 "
Stearine	200 "
Starch	500 "
Syrup	500 "
Carbolic Acid	5 "
Caustic Soda	10 "

2. Gold Lacquer for Brass

Alcohol	4 gals.
Turmeric	3 lbs.
Gamboge	3 oz.
Sandarac Gum	7 lbs.
Shellac	1.5 lbs.
Turpentine Varnish	1.0 pt.

3. Disinfectant

Aluminum Sulfate	6 oz.
or Zinc Chloride	1.5 "
Salt (table)	2.0 "
Calcium Chloride	3.0 "
Water to make total volume two pts.	

4. Spirit Enamel

Zinc Oxide	112 lbs.
Copal Varnish	6 gals.
Special Oil	6 "
Turpentine	1.5 "

Inspection of all four shows the mixed types of units for quantities and the lack of definite specifications especially glycerine, syrup, carbolic acid, and copal varnish. The concentrations are lacking and should be stated. Moreover the grades of material and directions for compounding with the proper kind of equipment should be included. In case a non-technical man, or a technical one who has not had experience with these materials, goes to a supply merchant, broker or importer with the request for stearine the question of kind and grade leads to misunderstandings and often either the return of goods or dropping of the project.

Closer inspection of Formula No. 1 shows that too many substances are involved and that a satisfactory size could be made with less components. The proportions are listed in parts which is usually the best way and signifies parts by weight in any unit chosen such as grams, ounces or pounds. Naturally the solids must always be weighed because a volume measurement is absurd for many reasons. Liquids can be converted to gallons or cubic feet by a simple circulation. For instance, if pure glycerine is required, reference to tables in any chemical handbook will show that the specific gravity is 1.260. One gallon of water weighs 8.328 lbs. and one gallon of glycerine weighs $8.328 \times 1.260 = 10.49$ lbs., and 5000 lbs. when divided by 10.49 lbs. gives 476.7 gals., or a tank which has a capacity of one cubic foot per every three inches of depth when filled to 190.9 inches will contain 5000 lbs. or 476.7 gals.

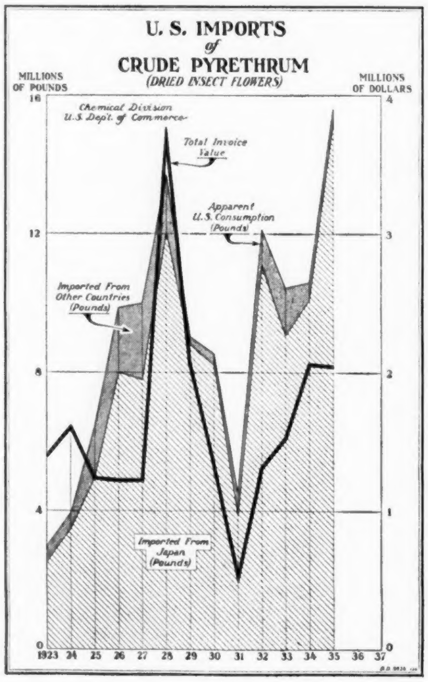
Moreover, heating is necessary by indirect means like steam jacketed kettles because glue, starch and two waxes, spermaceti and stearine, must be dispersed in an aqueous solution of sugar, glycerine, carbolic acid and caustic soda. The final product will be a combination of a peptized solution of starch and an emulsion of waxes in which two solids, gypsum and chloride of lime, are suspended, which necessitates grinding after the above described system has cooled. Of course there will be loss by evaporation and this being water it can be replaced but there will also be (mechanical) loss in the original kettle, transferring apparatus and grinder; as a result, the yield and basic cost must be based upon the quantity in the shipping tank.

The tank can be calibrated for cubic feet, gals. or lbs. of water per inch of depth and from the weight of a gallon (of the product) the total amount can be obtained. In a formula of this type there is no way of calculating the specific gravity or pounds per gallon: it must be measured by weighing one gallon at a temperature which is the conventional one for room temperature and is 20° C. or 68° F.

Comments of a similar nature could be made for all the other formulas submitted but space does not allow their presentation and in closing it should not be surprising to any one who hears the same story "They tried that formula and it is no good." Their respect for formulas, their insight into chemical changes and their experimental skill need improvement.

Japan's Pyrethrum Crop

Japan's current pyrethrum crop, part of which has already been harvested, is estimated to be approximately 22% heavier than that of last year and about 75% in excess of the '34 output, according to a report from the American Consul at Kobe, made public by the Commerce Dept.'s Chemical Division. In Honshu and Shikoku, where the harvest was completed in the latter part of July, best available estimates place the yield at 18,000,000 lbs., or about 3,000,000 lbs. more than were produced in these areas in '35. In Hokkaido where the crop is not harvested until the latter part of August the yield is still somewhat uncertain, though the Hokkaido Insect Flower Merchants' Association places the yield at approximately 12,000,000 lbs.



Should these estimates prove accurate Japan's pyrethrum crop will aggregate 30,000,000 lbs. during the current year, which compares with 24,400,000 lbs. in '35.

Insecticidal quality of the 1936 crop is expected to be about the same as last year, when it was considered good.

Demand for new crop pyrethrum has so far been slack. Despite unusually low prices, foreign buyers, and particularly those from the U. S., are avoiding commitments in anticipation of further price declines. It is estimated that 11 million lbs. of the new crop must be sold to the U. S. to avoid an unmanageable surplus with subsequent price demoralization. Foreign demand for old stock is nil and it appears that the entire stock will have to be disposed of in the domestic market.

Japan is the chief world source for this important insecticide material, which is used extensively in popular fly sprays, and the U. S. is the outstanding market, taking around 95% of the 17,000,000 lbs. exported from that country last year.

During the 1st 6 months of the current year the U. S. imported a total of 6,297,000 lbs. of pyrethrum flowers compared with 4,150,000 during the 1st half of last year.

The Crawling Menace

By C. M. Gwin

Director of Research, Baldwin Laboratories, Inc.

The silverfish

IS anything more exasperating to the Maintenance Engineer of a large manufacturing establishment than to be called upon to answer complaints from the various departments that crawling insects are actually interfering with production and annoying the employees? Let's listen in on a few of them over the extension 'phone in the office of the Maintenance Engineer—*

Bacteriological Laboratory—"Hello—Maintenance Department . . . this is Mr. Baker. We have had considerable trouble lately with the contamination of our cultures and we discovered the cause just a moment ago when we found a large colony of roaches in a corner of our 90° F. incubator. I would like to have you take care of the matter immediately, Mr. Riley."

Maintenance Department—"All right, Mr. Baker, I will send one of my men right up."

Librarian—"Hello—Maintenance Department . . . this is Miss James. I was just back in the room where we store our periodical publications, and I found hundreds of silvery gray bugs. They seem to be eating the surface from the paper. Can you come right up and get rid of them?"

Maintenance Department—"All of my men are busy at the present time, Miss James, but I will try to have one of them come up right after lunch."

Drying Room—"Hello—Mr. Riley . . . this is Fred Berger down in the drying room. I am having a number of complaints from our men who say they are contracting crab lice from the lavatories over here, and I wonder if you can come right up."

Maintenance Department: "Well, Fred, I am tied up for all of today, but I'll stop in the first thing tomorrow morning."

Our geologists and paleontologists tell us that cockroaches were among the first forms of insect life to appear on the globe. To be sure, these bugs have changed their habitats a great deal since that time. They belong to the same family as the grasshopper, and at one time also lived upon green foods, but upon finding an easier method of gaining sustenance, have changed their mode of living along with the growth and development of civilization and are now a universal pest.

In the southern half of the United States, several kinds of these pests live out-of-doors. However, most of them in the northern states live in the shelter of our heated buildings and have become very numerous and constitute a serious economic problem. They thrive especially well in warm, damp places, such as heated tunnels about water systems, and are transmitted from place to place.

Because of their preference for breeding in places where food and water are present, and in cracks in which they can hide themselves during the day and come out at night for food and water, they very frequently multiply to great numbers before being noticed.

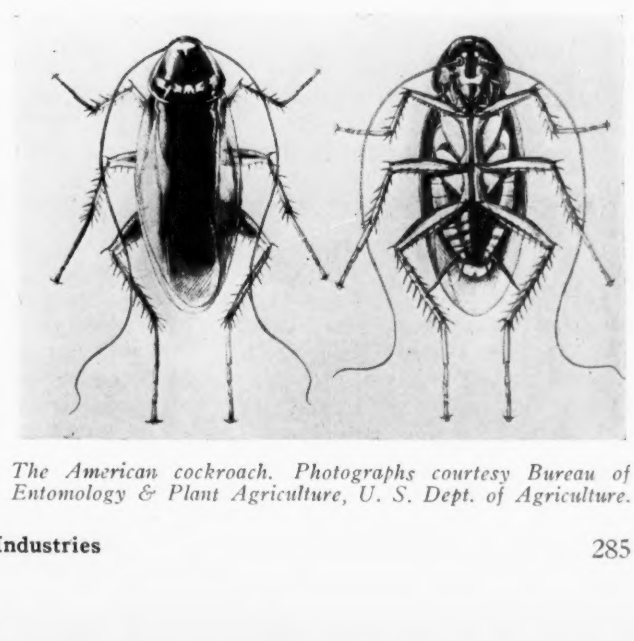
Their legs are especially well adapted for running, making it possible for the insect to be very agile in escaping. Most of these individuals are equipped with wings but only a very few species are capable of using them. Their bodies are thin and flat, allowing them to conceal themselves in cracks and crevices.

Because of their walking habit, cockroaches are one of the greatest insect carriers of filth and vermin. In his wanderings, the hairy appendages of the pest are dragged through the putrefactive fluids of the sewer and garbage can or over the wet surfaces of the urinal. Bacterial decomposition resulting in off colors and flavorings are many times attributable to the contamination by these pests.

There are four distinct kinds of cockroaches found in this country. The German cockroach, which is relatively small; the American cockroach, which is the largest of the species and dark brown in color; the Oriental cockroach, which is black and just a little smaller than the American; and finally, the Australian cockroach, which is just a little larger than the German and smaller than the Oriental and is light tan in color. The first three types are found most abundantly in the United States.

The mother roach lays several batches of eggs throughout her lifetime. Each batch is enveloped in a brown tobacco pouch-shaped case and carried about by her for several days before being deposited in some warm damp place where the young will find suitable living conditions.

The number of young that hatch from these capsules varies from fifteen to fifty, depending upon the kind of roach. The length of time required for the young to develop to adulthood depends upon the species, temperature, and amount of food present. Some develop as quickly as three months while others require as long as one year.



The American cockroach. Photographs courtesy Bureau of Entomology & Plant Agriculture, U. S. Dept. of Agriculture.

* Note: All names used herein are fictitious and are employed purely as a means of citing examples.

To control cockroaches successfully, we must remember that they have flat bodies and can get into small cracks and crevices and also that their legs are well adapted for climbing. It is therefore necessary to use insecticides which will penetrate the most difficult fissures. It has been found that wherever possible a good powdered insecticide of the pyrethrum-sodium fluoride combination type is preferable. In the more remote and difficult places, a good liquid household insecticide should be used and applied with an electric sprayer that finely atomizes the particles and drives them into the hiding places of these pests.

The pests that are troubling the Librarian are called "silverfish," because of their glistening, pearl-gray appearance. Like the cockroach, they shun light and are found in kitchens, attics, clothes presses, laundries, libraries, and frequently where drug products are stored.

These pests frequent these places because they are great lovers of heat and of carbohydrate foods, such as sugars, starches, and dextrins. All of these foods are found in the kitchen. Starched clothing is stored in attics and clothes presses. Starch is used in the sizing of the paper and dextrin paste is used in the binding of books that are found both in the attic and in the library. Starch is always found in the laundry, and all three carbohydrates are components of various vegetable drugs.

Like the roach, silverfish do not fly and have legs well adapted for rapid running. Their bodies are flat and slender, enabling them to hide between pieces of paper, books, and articles of clothing. These same characteristics make it possible for them to be easily transported in books, papers, stored clothing and foods, such as flour, meal, starch, tapioca, etc., and in laundry baskets. They frequently destroy paper, starched clothing, linens, lace or muslin curtains, silks, carpets, and plush coverings of furniture that have been sized. Wall paper has been known to scale off when these pests eat the paste from its back. In places where various vegetable and organic drugs are stored, they often may be found by the millions.

They are easily controlled by using the same methods as are employed in cockroach control, accompanied by frequent cleaning and airing.

A situation is not at all uncommon when workers pick up infestations and transport them to fellow workers by means of the companies' lavatories. When one becomes infested with these lice, the females proceed to attach their small white eggs to the larger hairs about the pubic region. The pest burrows beneath the surface of the skin to do its feeding, resulting in bluish-gray spots. This causes a severe itching, accompanied by inflamed spots caused by the feeding of the small lice. Cases of severe eczema have developed when the spots were scratched. The infestation is usually confined to the pubic region and arm pits and seldom ever gets to the eyelashes, eyebrows, or beard.

Once an individual is infested, the lice may easily be controlled by the use of "Blue Ointment"—mercurial ointment or a 10% solution of tincture of larkspur. Both parasiticides are manufactured by a number of pharmaceutical houses and may be obtained at one's drug store.

Chemicals for Seed Treatment

A new type of organo-metallic compound, namely, one containing both mercury and silicon, has been studied in the laboratories of the I. G. Some of the materials prepared have been found of value for pharmaceutical purposes as disinfectants, and also, in particular, as seed immunizers. Certain of the products studied are indicated in E. P. 450,256 of 1935 (just published), which covers their method of production and uses. According to this specification, soluble organic mercury compounds are treated with reactive silicon compounds, namely, silicic acid, its soluble salts, derivatives, and double salts. Process is preferably effected in the presence of a solvent or diluent such as water and alcohols. Inert materials such as talcum and kieselguhr can also be present.

The mercury compounds employed are those in which one valency of the mercury is directly bound to a carbon atom of an organic radicle and the other valency of the mercury is bound to a hydroxyl or acid radicle.

According to one example, 26.45 parts by weight of ethylmercury chloride are treated with 17 parts by weight of silver nitrate in alcoholic solution. Mixture is filtered with suction from the separated silver chloride and the alcohol driven off. Remaining ethyl mercury nitrate is dissolved in 200 parts by weight of water and mixed with a solution of 40 parts by weight of technical water glass in 50 parts by weight of water. Precipitate which separates is filtered with suction and dried. A mercury-silicon compound is obtained which is almost colorless, almost insoluble in water and alcohol, and does not melt on heating up to 250° C. No decomposition takes place on treating the mixture with concentrated hydrochloric acid when cold or on short heating.

In a further example, 15.9 parts by weight of methoxyethylmercury acetate are dissolved in the same quantity of water, and a solution of 20 parts by weight of technical water glass in 25 parts by weight of water is added. Reaction product soon solidifies to a white almost solid mass. It is filtered with suction, well washed with water and dried. An almost white powder, which is insoluble in water and alcohol, and which does not melt up to 250° C., is obtained. It is almost completely soluble in caustic soda solution. On pouring concentrated hydrochloric acid over the product decomposition takes place, whereby ethylene escapes, and silicic acid separates.

In another of the numerous examples given in the specification, 6.7 parts by weight of aluminum sulfate are dissolved in 10 parts by weight of water and treated with 27 parts by weight of water glass whereby a double salt is formed. The salt magma precipitating is filtered with suction, suspended in 75 parts by weight of water and mixed with a solution of 5 parts by weight of methoxyethyl mercury acetate in the same quantity of water and shaken. After shaking for 12 hours the solution is filtered with suction, washed with water and dried. Mercury-silicon-aluminum compound obtainable is a white powder which is insoluble in water and the customary organic solvents. British *Chemical Trade Journal*, Aug. 21st, '36, p.156.

Soap Standardization

Comprehensive work on the standardization of soap and detergents and their constituent materials is to be undertaken by the A.S.T.M. which has organized a new unit for this purpose—Committee D-12 on soap and detergents. New committee comprises representatives of consumers of soaps and detergents, producers, and a general interest group. Members are:

American Association of Textile Chemists and Colorists, American Institute of Laundering, American Oil Chemists Society, American Public Health Association, Bigelow-Sanford Carpet, Colgate-Palmolive-Peet, College of the City of New York, Gustavus J. Esselen, Inc., Hooker Electrochemical, Kenney-Herstein, Inc., Larkin Co., Lever Brothers, Los Angeles Soap (consulting member), R. H. Macy & Co.

National Association of Purchasing Agents, National Bureau of Standards, National Institute of Dyeing and Cleaning, New York Produce Exchange, Pennsylvania State College, P. & G., Pullman Co., Sears, Roebuck, Henry Souther Engineering, Southern Cotton Oil, Southern Pacific, Stillwell & Gladding, Inc., Swift, U. S. Navy, U. S. Testing Co., Allen B. Wrisley Co. (consulting member).

Officers are:

Chairman, H. P. Trevithick, N. Y. Produce Exchange; vice-chairman, F. W. Smither, of the National Bureau of Standards; secretary, B. S. Van Zile, Colgate-Palmolive-Peet.

Household Specialties

Exterminators Meet Oct. 26-28th

Plans for the annual convention of the National Association of Exterminators and Fumigators, to be held at the Statler in Cleveland on Oct. 26-28th, are now rapidly being formulated by the officers. Among those who will address us are Dr. E. A. Bach, principal entomologist of U. S. Dept. of Agriculture; Prof. J. J. Davis, chief in Entomology, Purdue University; Dr. P. W. Heerdt, an authority on European fumigations and pest control, who will visit the U. S.; and G. C. Oderkirk and E. M. Mills, both of U. S. Bureau of Biological Survey; and several representatives of manufacturers and supply houses, who will assist in a technical way with the "Research Clinics" on rats, termites, ants, roaches, fumigations, bedbugs, and business forms.

President Dold of the exterminators will preside at Cleveland

A number of supply houses have already definitely contracted for space, including du Pont; Murray-Nickell Co.; S. B. Penick; Sennewald Drug; Cyanamid; McLaughlin, Gormley, King; Liquid Carbonic; H. D. Hudson Mfg. Co.; and Breuer Electric Mfg. Co., and a number of others are considering space but have not as yet closed.

One of the features of the convention will be a display of members' telephone directory advertising and display cards and these should be sent at once to R. W. Laing, 2196 Bellfield ave., Cleveland, Ohio.

Control Standard Available

N. A. I. D. M's standard control insecticide (see C. I., July, p. 63) is now ready for distribution. Single bottles are $1.00 plus postage, cases containing 12, $5.00 plus postage. Orders should be sent to National Association of Insecticide & Disinfectant Manufacturers, 122 E. 42 st., N. Y. City.

Form Production Group

National Association of Production Management is a recently formed group which will sponsor meetings and act as a medium of exchange of ideas and information for those handling production problems in the chemical specialty, drug, food and liquor industries. Twelve equipment manufacturers acted as sponsors for the 1st meeting. Officers are: president, Wm. M. Bristol, Bristol-Myers; vice-president, Harold M. Bowman, Standard Oil of N. J.; secretary, Fred. Zegers, Squibb; and treasurer, H. F. Brownell, McKesson & Robbins.

Month's New Specialties

Lymar Sales, N. Y. City, has placed on the market a new rug shampoo; Pynol Co., Burlington, Iowa, is now marketing fine laundering soap flakes with a distinctive pine odor, and also a green liquid pine hair shampoo; Hewitt Soap, Dayton, Ohio, has a new toilet bar soap on the market under the trademark "Nocturne."

News of the Specialty Companies

Haag Laboratories, Chicago maker of soaps and specialties, is building a new laboratory. Reed Sanitary Supply, Kansas City, is a new manufacturer of small soap cakes for the hotel trade. Shurberg Chemical, Hartford, Conn., has sold its business on the manufacture of "Shur Klenz," a rug shampoo and general household cleaner, to J. Francis Dunphy of Rocky Hill, Conn. Shurberg will continue to market "Sur Klenze Creme," for the prevention of glasses from steaming. Receiver for property occupied by Gibson Howell, Jersey City, is seeking to oust the company for non-payment of rent.

Century Products, Kansas City, is marketing a soap dispenser designed by one of the company's salesmen. Irving Wexler is president of Buckingham Wax, Long Island City, recently formed to manufacture floor waxes and polishes.

Chicago Sanitary Products, 2526 W. Congress st., had a $15,000 blaze on Aug. 19th when soap boiled over from one of the cooking vats. The Lehon Co., St. Louis manufacturer of waterproofing materials has taken larger quarters at 1931 S. Vandeventer ave. Industrial Chemical Research & Sales is a new concern at Derry, N. H., and will make a cleanser. Industrial Colloids & Chemicals, Inc., is a new Knoxville concern formed to make chemical specialties for the textile, tanning and paper trades. Lee Chemical Co., Inc., chemicals and cleaning fluids, has taken over a 4-story building at 89 Woodbine st., Hartford, Conn.

S. B. Penick & Co., leading botanical drug manufacturer, has established a special export department to handle its increased business from abroad, it was announced last month. Henry R. Webel is manager.

The Big Bee Laboratories, maker of metal polishes under the "Big Bee" trade name, is a new enterprise in Schenectady, N. Y. Plant, under direction of J. H. Btag, is on Church st.

Specialty Companies Using Premiums

Chemical specialty manufacturers are fertile ground for premium sales. Companies reported in the past month adopting sales promotional plans involving the distribution of premiums include:—Morton Salt (2 cans gets a Punch-O-Bag); P. & G. offering a royal blue occasional plate for 1c and 1 large size package of Ivory Flakes; Same company pushing Oxydol in Arkansas with an offer of a silver-plated kitchen spoon for 1c and a 10c package.

In Memphis recently residents were able to obtain a Turkish towel for 10 wrappers from Crystal White Soap, a Colgate-Palmolive-Peet product. In Boston, Kendall Manufacturing offered a 19-piece set of glassware for 88c and 6 whale trade marks from 6 large 25½ oz. packages of Soapine. P. & G. is currently giving Oxydol sales a boost over the radio with a $10,000 jingle contest. B. T. Babbitt's Bab-O is getting a lift with an offer of a savings bank for 2 cans of the cleanser. Lest there be any misunderstanding it is just a David Harum Bank, the name coming from the country philosopher on the NBC network 5 days a week at 11 A. M.

P. & G. is "marrying" 2 products. Newspaper ads have been offering a 25c bottle of Old English Furniture Polish for only 1c when 1 large package of Oxydol is purchased at the regular price.

Federal Trade Commission Notes

Chemical specialty makers continue to be scrutinized. In the past month several stipulations were signed, including: Frank Jones Chemical Works, 57 Lexington ave., Brooklyn, will stop using "Krome Plate" as a trade name or any imitation of the word "chromium" to imply that the product contains chromium. Seaver Exterminating Systems, 185 Wabash ave., Chicago, agreed to cease false and misleading advertising on a correspondence course in vermin extermination.

Personnel Changes in the Specialty Field

Colgate-Palmolive-Peet's new assistant manager of the soap dept. is J. A. Reilly, formerly in charge of eastern sales on "Octagon." Edgar A. Murray Co., Detroit, maker of "Doom" household specialties, has a new general manager, J. W. Bailey. He was with Tanglefoot a number of years ago and was very active in N. A. I. D. M. circles prior to '30. W. E. Jackson has purchased Theodore Kaleff's interest in Azuria Chemical, Akron, and will continue the business without change of name. Leonard H. Schulties, son of Hewitt Soap's vice-president, Martin F. Schulties, is now a special sales representative of the company, and is calling on the Metropolitan chain store trade.

Promotional

Cudahy Packing's radio program for Old Dutch Cleanser will be expanded to a group of network stations Sept. 28th. Program, "Batchelor's Children," has been aired locally in Chicago over WGN for a year.

Palmolive advertising will henceforth feature the fact that the Dionne quintuplets have been using that soap on the prescription of Dr. Dafoe.

Gnadinger Issues New Edition of Book

C. B. Gnadinger, McLaughlin Gormley King's research director, has just completed a thoroughly revised and enlarged edition of his famous Pyrethrum Flowers. Book is on sale through the company whose headquarters are at Minneapolis.

Successful Dealer Display Campaign

Leo Nejelski, Swift's advertising manager, writes on display contests sans headaches in *Printer's Ink Monthly* for August, outlining 12 factors for success as discovered by practical experience from the recent Sunbrite contest.*

Bulgaria Forsakes Rose for Pyrethrum

Bulgaria's national policy of reducing rose acreage continues to make progress as farmers become more accustomed to the cultivation of pyrethrum which is recommended by the Government as a substitute crop.

Merck Offers Home Booklet

Merck is distributing a new booklet, "Home Hygiene" which contains 24 pages of helpful information and illustrations dealing with the problems which daily confront the women in the home. Several of the Merck chemical specialties are featured. Distribution is through the retail druggists.

Industrial Specialties

Outlook for Soap Companies Hopeful

P. & G. is running several weeks behind orders, although plants have been operating at or near capacity for more than 2½ years. Prices are firm and, while no advances have been made as yet or are believed likely for the immediate future, the price trend definitely is upward.

Large scale future delivery orders and contract business are still being accepted subject to the approval of the home office, but it is understood that district sales managers have been confidentially advised to go slow in promotion of such business and not commit the company to more than 30-day future contracts.

No material changes in prices of either bulk or packaged soaps have been made this year by any important producer.

Currently, finished soap stocks in hands of dealers continue abnormally low. Leading trade interests expect firm to rising markets for oils and greases used in soap manufacture for at least the rest of the year. Depleted dealer stocks and steadier tone of raw materials combine to give the soap industry an improved outlook for the final 6 months, compared with the 1st half year.

The oversupply of tallow earlier this year caused by unusually large importations depressed markets for other domestic and imported oils and greases. Stocks of this commodity now are nearer normal, the price has recovered from its early weakness and the general level of soap fats has firmed.

In addition, the improved price situation was brought about in part at least by belief that drought conditions might create a scarcity of certain oils and lead to increased demands for other oils.

Louisiana Exempts Soap from Tax

Soap has been exempted from the recently enacted food, drug and cosmetic control measure in Louisiana as well as from other State and local tax statutes, according to an announcement issued recently by Roscoe C. Edlund, manager, Association of American Soap & Glycerine Producers.

Recently enacted 2% State retail sales tax in Louisiana also does not apply to soap, "the retail price of which is 10c or less per bar or package." Soaps have also been exempted from the additional 2% retail sales tax in New Orleans.

Month's New Industrial Chemical Specialties

Erusto Products, Easton, Pa., is introducing FIL-Trolax, a new filter soap and detergent for the dry cleaning field. A concentrated cleaner that dissolves grease, fat, oil, organic stains, soap-stains and dirt is being marketed by Linick, Green & Reed, Inc., 55 E. Washington st., Chicago. Known as "Pal" (Phosphor-Alum), this cleaner is said to be free from injurious substances, to be odorless and completely soluble in water and to contain no filler, abrasive, caustic, ash or acid. Manufacturers recommend "Pal" cleaner before electro-plating, particularly with acid baths such as duplex copper, acid nickel, rhodium, chromium, etc. It is also claimed to be ideal for electrocleaning and as an addition agent to many types of plating baths.

Cements that are waterproof and which have strong durable adhesion to rubber, leather, fabric, paper, cork composition, and metal are announced by Boston Blacking & Chemical, Cambridge, Mass. Cements are called "Bostik."

New Type of Boiler Scale Remover

"Elek-Trol-Ik" (Oneida Electric Mfg., Green Bay, Wisc.) is a new boiler scale remover and eliminator which is said to create an electrolytic action within the boiler.

New Foreign Detergent Formulas

The foreign patent literature recently has contained a number of new formulas for detergent compounds, including the following: The I. G. in Brit. Pat. 408,708 suggests mixtures of sodium hexametaphosphate together with ethanolamine soaps and/or sodium salts of sulfonated fatty alcohols, for the purpose of cleaning white household linen, rayon hose, floor covering or for scouring raw wool.

British Patent No. 419,846 refers to a mixture of 1 part methylated spirit, 3 parts 5% acetic acid and 0.08 parts of Igepone T powder, which is to be employed for cleaning carpets.

A recent Swiss patent for a washing composition consists of soap powder, borax, sodium perborate and fatty alcohol sulfonate.

Dyers and Cleaners Set Convention Week

National Association of Dyers & Cleaners will hold the next annual convention in Cincinnati at the Netherland-Plaza, probably in the 3rd week of January.

Kleen-Stik Appoints Winetroub

Kleen-Stik Products, San Francisco, making an advertising adhesive, appoints E. S. Winetroub as sales manager for the N. Y., N. J. and New England territory. His headquarters will be in N. Y. City.

Control of Moths in Warehouses

A new process for the control of Indian Meal Moth and Cacao Moth in warehouses is mentioned in one of the British trade journals. It is based on the penetrating power of a very finely atomized solution containing the active principles of pyrethrum. Its success depends to a great extent on the very fine degree of atomization of the spray solution. It is not enough merely to spray the room or warehouse, it is imperative that the spray should be broken up into a very finely divided condition so that a fog or particulate cloud of insecticide is formed. It is essential for the correct type of atomizer to be selected. The process is said to have been reported by the technical laboratories of the British firm, Stafford, Allen & Sons.

* See insert, Chemical Specialties Section, this issue.

Agricultural Specialties

Napthalene in Control of Greenhouse Pests

Commercial flake naphthalene, costing from 8 to 12c a lb., when vaporized in the greenhouse controls the common red spider and the greenhouse thrips very effectively and is a satisfactory method for combating pests not controlled by nicotine or by hydrocyanic acid gas. Naphthalene fumes kill by penetrating the respiratory system of insects and spiders, causing paralysis and death. Details of experiments are given. W. D. Whitcomb, *Mass. Sta. Bul.*, 326 (35), p31.

Studies in Dinitro-o-cyclohexylphenol Efficiency

Data from orchard trials in '35 indicate high efficiency for the dinitro-o-cyclohexylphenol in petroleum oil against the eggs of the rosy apple aphid and the black cherry aphid. Concentrations of oil and toxicant that are effective against aphid eggs seem also to be entirely satisfactory for the control of the San Jose scale. Less extensive trials indicate that the black cherry aphid can be controlled with as low, or possibly lower, concentrations than are necessary for rosy aphid control. W. C. Dutton, *Jour. Econ. Ent.*, 29, '36, No. 1, p62-65. In the same issue is a similar study by I. F. Kagy & C. H. Richardson, p52-61.

Zinc Sulfate Controls White Bud in Corn

Zinc sulfate has been used successfully by workers at the Florida State Experiment Station for the prevention of white bud, a nutritional disorder of corn. Workers are also experimenting with this product for the control of citrus mottle leaf.

Flint Warns on Grasshoppers and Termites

Not for about 3 months yet can definite predictions be made as to whether the Illinois grasshopper population for next year will be worse than the hordes now consuming Illinois crops. W. P. Flint, chief entomologist, Illinois Natural History Survey and College of Agriculture, University of Illinois, has given this answer to the hundreds of farmers who are asking about chances of escaping the scourge next year. The same authority has issued a warning on termites. He points out that not more than 10% of the buildings now constructed are built so as to be termite resistant.

Paradichlorobenzene for the Peach Tree Borer

"Gassing" peach tree borers with what is commonly known as "P. D. B.", which is short for the chemical name "paradichlorobenzene," is the least laborious and the safest and most effective method of fighting this pest, if a few precautions are observed, says Dr. D. M. Daniel, entomologist at the N. Y. State Experiment Station at Geneva. The last of August and early September is the best time to "gas" the borers, says this authority, who sets forth full directions for the use of "P. D. B." against the peach tree borer, both by the old "crystal ring" method and by a newer method that is proving highly satisfactory and less laborious than the old procedure, in a specially prepared circular, a copy of which may be obtained without cost upon request to the Experiment Station at Geneva.

Copper Oxide for Hop Mildew

Red Copper Oxide spray (1-50) controls mildew on hops without injury while Bordeaux treatment does not. J. G. Horsfall & R. O. Magie, N. Y. State Experiment Station, Geneva, N. Y.

Mineral Oil Sprays for Citrus Red Mite

Mineral oil sprays have been found to control citrus red mite, which is increasing in importance in California. There are, however, certain conditions under which oil sprays are undesirable with respect to the citrus tree, and at present the most promising material other than oil is said to be Selocide, a proprietary selenium compound, although in certain areas, and under certain conditions in all areas, the Selocide combinations used have not always given satisfactory results. Further work with selenium, sulfur, naphthalene, thiocyanates, oils, and other materials is said to be in progress. A. M. Boyce, *Jour. Econ. Ent.*, 29, '36, No. 1, p.125-130.

Fear Cotton Leaf Worm Infestation

The cotton leaf worm, one of the most destructive pests ever found in southern cotton fields, is headed for North Carolina this year, according to C. H. Brannon, extension entomologist at the State College. He urges all cotton growers to keep a close watch for leaf worms in their fields, and to start dusting with calcium arsenate as soon as worms are discovered, using from 5 to 7 pounds per acre, similar to the way the poison is applied for boll weevil control.

Calomel for Root Maggot Control

Calomel is a promising insecticide for root maggot control used at a rate of 3 or 4 oz. to 10 gal. of water. H. Glasgow, N. Y. State Station Report, 2, '36, No. 3, p.3,7,13.

Copper Oxide Better than Bordeaux on Tomatoes

N. Y. State Agricultural Station, Geneva, reports that Bordeaux mixture stunts tomato plants slightly so that they bloom later than if they were not sprayed, reducing early pickings and delays to the crop and injuring the blossom thereby cutting yields. New red copper oxide spray is not as detrimental.

Research Work at Pa. State Experiment Station

Several milder substitutes for liquid lime sulfur, when used in the later sprays in 1935, resulted in only slight increases of scab. Fruit russet injury was significantly reduced only by liquid lime sulfur diluted 1-75. Period for controlling apple aphids was extended by successful use of dormant sprays of creosote oil. A form of "fixed" nicotine showed promise in codling moth control while avoiding spray residues and reducing spray injury. On well-pruned trees of medium size no significant differences in results or cost were indicated in a comparison of "broom" and gun spraying. This is a report of progress and conclusions are not drawn. H. W. Thurston, Jr., H. N. Worthley, *Pennsylvania Agricultural Experiment Station Bull.*, May, '36.

Niagara Sprayer & Chemical's Outing

Niagara Sprayer & Chemical's employees and friends enjoyed a company outing Aug. 9th at Olcott Beach near Middleport, N. Y. Lace Products has been formed to succeed to the business of Lockwood Brackett, Boston, maker of Laco castile soap. Founder T. R. Lockwood remains as a v.-p.

Study in Toxicity of Rotenone

When given orally, rotenone dissolved in oil is much more toxic than when given as the solid or in suspension. The oral minimum lethal dose for white rats is about 25 mg. per kg., and for guinea pigs 12 mg. per kg. Toxicity of rotenone ingested orally depends upon the physical state of the compound. Finely divided rotenone is more toxic than coarse crystals. Toxicity of solid rotenone is increased by feeding fats, the increase being roughly parallel to the amount of fat ingested. When sublethal doses of rotenone are given daily in olive oil, the total dose received before death is larger than the acute toxic dose by an amount which varies in inverse order with the size of the daily dose. This is taken to indicate that there is a partial elimination or detoxification of the rotenone, and either that the compound accumulates in an active form in the tissues or that the injuries are additive. *Toxicology of Rotenone*, Howard D. Lightbody & Joseph A. Mathews, U. S. Dept. of Agriculture, *Industrial & Engineering Chemistry*, July, '36, p809.

Pest Control Laboratory to Wilmington

Pest control research activities have been reorganized in the chemical department of Grasselli Chemical, of which E. A. Taylor is director, and transferred from Cleveland. Research has been organized as a separate division with Dr. W. H. Tisdale in charge.

Packaging, Handling and Shipping

When Considering a New Product

Research for new products should be along the lines of 15 questions developed by H. R. Gogay, president, American Merchandising Service, in *Connecticut Industry* for May.

(1) Is there a consumer need for such an article?
(2) Is there a consumer demand?
(3) What is the number of possible customers?
(4) Where are they located?
(5) What is the attitude of possible customers towards the product?
(6) What is the attitude of trade if product is to be sold through jobbers and dealers?
(7) What is the competition that must be faced?
(8) What is the price that must be secured to make a profit?
(9) What are the distinctive features of product as compared with other product that consumers are now using in its place?
(10) What are the sales and distribution methods that afford the best chances for initial success?
(11) What are the later methods of sales and distribution if the first are likely to be superseded?
(12) What is the form that goods must take as to quantity or unit sold, package, trade mark and so forth?
(13) What is the profit necessary to jobber, dealer, or commission to salesman?
(14) What type of sales promotion methods should be used?
(15) What capital is required to finance the project?

Scale with Revolutionary Principles

The Shadowgraph is said to be more than just another addition to the already numerous present-day models of scales, in fact, the manufacturer claims it is a revolutionary new principle in precision weighing. Over and underweight scales of the past have followed tower construction with more or less intricate indicating mechanism, which often caused a parallax reading. This new principle eliminates all indicating mechanism and thereby reduces working parts by 30%. With the elimination of all indicating mechanism, and the substitution of a simple shadow on the dial, a parallax reading is impossible. This scale, without a dial tower, lends itself to modern, present-day design. The Exact Weight Scale Co., Columbus, Ohio, is the manufacturer.

Largest Rubber Conveyor Belt

U. S. Rubber has just completed manufacture of what is believed to be the largest roll of conveyor belt ever made. It will soon be handling copper ore on a new installation at a plant where the widest belt used previously was 48 inches. This new 60 inch record breaker is a part of the equipment that makes possible the handling of approximately 20,000 tons per day.

I. C. C. Rate Changes on Certain Chemicals

I. C. C. has granted authority, under certain conditions, for establishment of a freight rate of $1 per 100 lbs. over all-rail routes and 98c per 100 lbs. over ocean-rail routes on a number of commodities in mixed carloads from Baltimore to Memphis, and maintenance of higher rates to intermediate points. In the commodities are liquid flavoring extracts in glass; dry and liquid insecticides in metal cans; drugs and medicines, castor oil, and turpentine in glass; epsom salt in cartons; cream of tartar in metal cans; liquid glue in glass; alum and borax in boxes, or barrels; sulfur in bags, barrels, boxes, or mats; and dry sulfate of iron in glass, bags, barrels, or boxes, or in bulk. New rates were authorized to enable rail carriers to meet water competition.

Rules for Package Design Simplified

George M. Davison, artist and sales manager of Higgins & Low, Inc., has developed a slide rule which quickly calls attention to the essential elements that should be considered when designing a new package. This unusual and unique aid appeared in the August issue of *Printers' Ink Monthly*, p24. The same issue contains an instructive article by Packaging Expert C. B. Larrabee on "Packages—Still Room for Improvement."

Continental Buys Wilkes-Barre Can

According to reports, Contnental Can Co. (of Pennsylvania) a subsidiary of Continental Can, acquired the assets and can manufacturing business of Wilkes-Barre Can, Wilkes-Barre, Pa., as of Aug. 9th. Wilkes-Barre Can, established in 1858, manufactures a general line of tin containers including oil and grease cans, drums, buckets, cannister sets, etc.

The Literature

Articles of interest to the chemical and process industries particularly noted in a monthly review of the U. S. and foreign periodicals.

Dyes. A historical review of the development of the anthraquinone dyes by R. Fraser Thomson, British *Journal of the Society of Dyers and Colorists*, July, '36, p237.

Fertilizer. A report on TVA research activities on the manufacture of superphosphate from phosphoric acid and ground phosphate rock. *Industrial & Engineering Chemistry*, August, '36, p923.

Historical. Dr. W. H. Brindley discusses "The Chemical Industries of Lancashire and Cheshire." Article gives a splendid history of the development of the British alkali field and then takes up in a general way the growth of a number of other divisions of the industry. *Chemistry and Industry*, supplement, July 10th.

Industrial Chemicals. Dr. F. N. Peters, Jr., of The Quaker Oats Co., reviews the history of the development of the "Furans" during the past 15 years and discusses the use of Furfural in resins and in petroleum refining; then briefly summarizes other minor uses. *Industrial & Engineering Chemistry*, July, '36, p755.

Industrial Chemicals. W. K. Dodd of the Southern California Gas Co. discusses gas dehydration by the calcium chloride brine method. *Gas*, August, '36, p41.

Metals. Jack Delmonte discusses the history, occurence, methods of production of Beryllium and its alloys. Part 1 appears in *Metals & Alloys*, July, '36, p175.

Mining. Present position as to geophysical methods are surveyed—a brief resume of a lecture by the late Conrad Schlumberger and reported in *Revue Petrolifere*. British *Petroleum Times*, Aug. 1st, '36, piii.

Plant Operation. A number of aspects of the problem of pumping and acid handling in chemical plants are discussed by Eric A. Reavell, British *Chemistry & Industry*, July 24th, '36, p586.

Naval Stores. An interesting discussion of what is ahead for the naval stores industry and a report on what the Bureau of Chemistry and Soils has done for the improvement of the industry by Henry G. Knight, chief of the division. *Manufacturers' Record*, August, '36, p34.

Plasticizers. Dr. A. Kraus' articles appearing in various foreign journals over the past 6 years are being summarized in a series of articles on the properties and uses of the various plasticizers, the 1st of which appeared in *Paint, Oil & Chemical Review*, July 23rd, p9.

Rayon. Harold B. Vollrath, who recently wrote an article for C. I. on staple fibers, discusses a new mechanical method for making viscose. *Rayon Textile Monthly*, July, '36, p45(435).

Resins. Herman A. Bruson of Rohm & Haas delivered at the summer technical conference at Gibson Island, Md., conducted by Johns Hopkins, a lecture on the synthetic resins from natural rubber. This was reproduced in *The Rubber Age*, August, '36, p269.

Sewage Disposal. The German water treatment authority, Dr. Hermann Bach in "Chemical Or Biological?" summarizes the new trends in sewage disposal. *Water Works & Sewerage*, Aug., '36, p.287. In the same issue Weston Gavett supplies valuable comments on chemical treatment of sewages.

Tanning Materials. Frederic L. Hilbert supplies a study of some of the interesting physical and chemical properties of quebracho wood. *Hide & Leather*, July 11th, '36, p23, Aug. 8th, p13.

Textile. The part played by glycerine in the silk and rayon processing fields is discussed by Dr. Georgia Leffingwell, *The American Silk & Rayon Journal*, July, p19.

Textile. Noel D. White discusses the use of phosphates in the dyehouse. A short, practical treatise on phosphates and tin-weighting. The pH of the several phosphates is reported on. *American Dyestuff Reporter*, July 13th, '36, p371.

New Products— New Packages

Chas. M. Higgins & Co., Inc., manufacturing drawing inks since 1880, is introducing a complete line of inks for fountain pens and dip pens. Egmont Arens was the designer; bottles are by Hazel-Atlas Glass; caps by National Seal; and labels by U. S. Printing & Lithograph. Below, Bobrick's Pine Dog Soap is topped by a cap produced by Phoenix Metal Cap of Chicago.

Goodrich's research "labs" develops a "spot remover" and packages it in the patented Vacutop combination bottle and top.

"Wunder" Cleaning Fluid is also "topped" by a product of Phoenix Metal Cap. This photograph and the one showing Bobrick's Pine Dog Soap are by "Heetfield-Tillou."

Continental Can is the manufacturer of this attractive container for "Mystic Foam," a new cleaner for upholstery and rugs.

New Trade Marks of the Month

364,407
TIFFANY TEX
FOR BEAUTIFUL WALLS

364,448
PYLAKROME

365,484
NECO

365,687
COLUMBIAN

365,745
LASTIC

366,212
PARATAN

367,243
DEC-O-KOTE

368,220
FARM-O

371,092
DES-TEX

371,250
ÆTNA PORTLAND CEMENT

371,924
INSELTILE

371,926
MERSOL

371,969

371,972

372,050
Lite-ning KOL

372,157
RAIN E DAY SHOE OIL

372,244
MAZIC

372,589
DE

372,762
BUCKLEY & SCOTT SILVER ARROW FUEL OIL

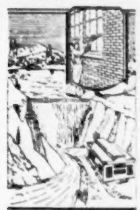
372,814
AMARINE

372,997
A-77

373,286
CUCO B

373,675
CCC

374,957
DAMIT



375,454
SUN BRYTE TRADE MARK WASH

376,049
LAUXITE

376,050
LAUXREZ

376,393
FANTOM-FAST

376,644
PENNALUX

376,645
LUBROLUX

Trade Mark Descriptions†

364,407. Frank J. Reilley, San Francisco; filed Apr. 29, '35; for earth plastic paint for interior decoration of walls; use since Sept. 1, '34.

364,448. Pylam Products Co., Inc., New York City; filed May 1, '35; for dyes; use since Oct. 2, '26.

365,484. Southern States Oil Co., Charleston, S. C.; filed May 27, '35; for motor-fuel oil, gasoline, kerosene, and lubricating oil; use since Dec. 1, '34.

365,687. Columbian Rope Co., Auburn, N. Y.; filed June 1, '35; for bonded bodies or articles composed essentially of vegetable fibres used for buffing or supporting abrasive materials; use since May 6, '35.

365,745. J. H. Smith Veneers, Inc., Chicago; filed June 3, '35; for veneers made of wood and the like; use since Mar. 12, '35.

366,212. Ritter Chemical Co., Inc., Amsterdam, N. Y.; filed June 14, '35; for tanning material; use since January '31.

367,243. Oliver Johnson & Co., Inc., Providence, R. I.; filed July 13, '35; for ready mixed paints; use since Jan. 1, '10.

368,220. Farm-O Mfg. Co., Decatur, Ill.; filed Aug. 12, '35; for animal and insect repellent; use since '24.

371,092. Horace C. Ettie, Miami Beach, assignor to Research, Inc., Miami Beach, Fla., a corporation of Florida; filed Nov. 2, '35; for chemical compounds—moth destroyers, dry-rot preventatives and rug preservatives; use since July 1, '35.

371,250. Aetna Portland Cement Co., Bay City, Fenton and Detroit, Mich.; filed Nov. 7, '35; for Portland cement; use since Apr. 30, '35 and since '02 for the pictorial representation.

371,924. Mastic Asphalt Corp., So. Bend, Ind.; filed Nov. 25, '35; for weatherproofed roofing and siding material; use since Nov. 12, '35.

371,926. Merrimac Chemical Co., Everett, Mass.; filed Nov. 23, '35; for denatured and proprietary solvent alcohol; use since Feb. 2, '33.

371,969. Halstead Products Co., Oakland, Cal.; filed Nov. 25, '35; for oils and greases—graphite oil, oil for blending with crank case lubricants, and oil for treatment of internal combustion engines; use since Sept. 20, '35.

371,972. Hoover Co., No. Canton, Ohio; filed Nov. 25, '35; for metal castings; use since Mar. 18, '35.

372,050. DuBois Soap Co., Cincinnati, Ohio; filed Nov. 27, '35; for abrasive and cleansing powder; use since Apr. 5, '35.

372,157. Theo. Bergmann Shoe Mfg. Co., Inc., Portland, Ore.; filed Dec. 2, '35; for shoe oil; use since Sept. 4, '34.

372,244. Hanson-Van Winkle-Munning Co., Matawan, N. J.; filed Dec. 4, '35; for base metal anodes for electroplating; use since Nov. 8, '35.

372,589. Di-Electric Corp., Harrison, N. J.; filed Dec. 13, '35; for liquid dry cleaning preparations; use since Aug. 9, '35.

372,762. Buckley & Scott, Inc., Providence, R. I.; filed Dec. 18, '35; for fuel oil; use since Sept. 10, '35.

372,814. American Aniline Products, Inc., New York City; filed Dec. 19, '35; for wetting out agents (surface tension depressants); use since Feb. 28, '34.

372,997. Rubber Service Labs., Akron, Ohio, assignor to Monsanto Chemical Co., St. Louis; filed Dec. 23, '35; vulcanization accelerator in curing of rubber articles; use since Jan. 26, '33.

373,286. Cunningham Cleanser Corp., New York City; filed Jan. 2, '36; for washing and scouring powders, paste soap, and detergents without soap; use since Apr. 1, '29.

373,675. Chipman Chemical Co., Inc., Bound Brook, N. J.; filed Jan. 15, '36; for insecticides, fungicides, and weed killers; use since Feb. 13, '35.

374,957. Battenfeld Grease & Oil Corp., Kansas City, Mo.; filed Feb. 15, '36; for caulking compound; use since July 17, '30.

375,454. Sarah Monkarsh (Sun Bryte Wash Products), Chicago; filed Mar. 2, '36; for bleach, deodorant, and disinfectant; use since Apr. '32.

376,049. I. F. Laucks, Inc., Seattle, Wash.; filed Mar. 16, '36; for synthetic resins; use since Mar. 7, '36.

376,050. I. F. Laucks, Inc., Seattle, Wash.; filed Mar. 16, '36; for synthetic resins; use since Mar. 7, '36.

376,393. National Marking Machine Co., Cincinnati, Ohio; filed Mar. 25, '36; for printing ink; use since Dec. 16, '35.

376,644. Societe Commerciale des Produits du Petrole, Paris, France; filed Mar. 31, '36; for lubricating oil; use since Apr. 14, '33.

376,645. Societe Commerciale des Produits du Petrole, Paris, France; filed Mar. 31, '36; for lubricating oils; use since Sept. 7, '34.

*Chemical Specialty Patents**

Agricultural

Process of making a fertilizer containing carbon. No. 2,048,658. Josef Jannek, Ludwigshafen, and Hugo Weitzel, Mannheim, Germany, to German I. G., Frankfort, Germany.

Production of nicotinium salts. No. 2,048,-885. Stephen Hellicar Oakeshott, Manchester, England, to Imperial Chemical Industries Ltd., England.

Production of a purified pyrethrin concentrate. No. 2,050,974. Frederick B. La Forge, Clarendon, Va., and Herbert L. J. Haller, Washington, D. C., to the free use of the U. S. public.

Process of making a fertilizer containing ammonia, water, and potassium nitrate. No. 2,050,493. Charles K. Lawrence, Syracuse, N. Y., and Edward W. Harvey, Highland Park, N. J., to Atmospheric Nitrogen Corp., N. Y. City.

Production of a dry fertilizer material formed by mixing alcohol distillery slop and calcium cyanamid and heating to a temperature between 130°-212° F. No. 2,049,525. Albert G. Stillwell, Cos Cob, Conn.

Production of a non-hygroscopic fertilizer consisting of a dried reaction product of ammonia and alcohol distillery slop. No. 2,049,-524. Albert G. Stillwell, Cos Cob, Conn.

Household

A dauber for applying shoe paste, equipped with a handle and made with a permeable fabric bag containing a cartridge of shoe paste. No. 2,048,103. William S. Cleaves, Wollaston, Mass.

A polish composed of non-sticky, non-greasy wax in water, an agent to lower the surface tension of this aqueous solution, soap, and a resin component having a volatile radical incapable of breaking down the wax emulsion. No. 2,048,303. Milton D. Swartz, Baltimore, Md.

A pumping apparatus for distributing insecticide. No. 2,049,194. Horace H. Chapin and Don E. MacDonald, Batavia, N. Y., to The R. E. Chapin Mfg. Works, Batavia, N. Y.

(Specialty Patents continued on next page.)

* Patents covered in this issue include those appearing in the *U. S. Patent Gazettes*, July 21 to August 18.

† Trade-marks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, middle week July 21 to August 18.

Specialty Patents (Continued)

Preparation of a chewing gum base, free from "burnt rubber" taste, containing rubber, hard fat, and resinous material. No. 2,050,272. Franklin V. Canning, N. Y. City, to Sweets Laboratories, N. Y. City.

Production of an insecticide containing essentially a diaryl thioxine. No. 2,049,725. Lloyd E. Smith, Washington, D. C., to the free use of the public in the U. S. A.

An immersion solution for removing silver tarnish in the presence of a metal electropositive to silver, containing diaminopropanol, ammonium chloride, and water to form a 1%-3% solution. No. 2,051,697. Wilmer C. Gangloff and Russell H. Hieronymus, Cincinnati, Ohio, to The Drackett Co., Cincinnati, Ohio.

Construction of an insect trap including a moat for containing an insecticide barring egress. No. 2,051,800. Wm. J. Lindecker, San Francisco, Calif.

Industrial

Impregnation of wrapping paper with an oil soluble copper compound dissolved in petrolatum, which prevents spreading of fungi from points of fungus propagation. No. 2,047,975. Leo Liberthson, New York, N. Y., to L. Sonneborn Sons, Inc., Del.

An embalming composition especially adapted for hardening tissues from the outside of the body comprising an emulsion of formaldehyde in a fatty substance containing lanolin, and a buffer agent to prevent the destruction of the emulsion by a drop in pH. No. 2,048,008. Hilton Ira Jones, Wilmette, Ill., to the Naselmo Corporation, Chicago, Ill.

Production of concentrated easily fluid gelatine solutions by the addition of furfuryl alcohol and tetrahydrofurfuryl alcohol in the process. No. 2,048,499. Walter Gellendien, Berlin-Charlottenburg, and Johann Eggert, Berlin, Germany, to Deutsche Hydrierwerke Aktiengesellschaft, Berlin-Charlottenburg, Germany.

Prepared roofing consisting of a felted, fibrous base, a sealing coat of waterproofing material, and a masking layer of grit imbedded in the surface exposed to the weather. No. 2,048,596. Walter H. Cady, Los Angeles, by mesne assignments to The Patenting and Licensing Corp., Boston.

An adhesive base composition consisting of xanthogenized mixture of 2 or more kinds of seed hulls. No. 2,049,311. George H. Osgood and Russell G. Peterson, Tacoma, Wash.

Production of an organic wax modifier. No. 2,049,058. Anthony H. Gleason, Elizabeth, N. J., to Standard Oil Development.

Preparation of a soap by treating an olefin of more than 7 carbon atoms with fuming sulfuric below 40° F., adding an excess aqueous alkali, and heating to hydrolyze unstable products. No. 2,049,055. Stewart C. Fulton and Hans G. Vesterdal, Elizabeth, N. J., to Standard Oil Development.

A liquid coating for cement, consisting of Portland cement, sodium phosphate, calcium chloride, and water. No. 2,048,932. Andrew Hartvedt, Kansas City, Mo.

A detergent obtained by decomposing raw silk with an alkali and mixing with soap. No. 2,048,797. Paul Kuller, Berlin-Friedenau, Germany.

Production of a transparent fish offal glue solution by treating ordinary fish offal glue with substances which adjust the pH of the solution to 5 or less. No. 2,048,728. Edward F. Christopher, Chicago, to Industrial Patents Corp., Chicago.

Production of a readily removable temporary protective covering for an article having an easily damaged surface, by the application of a thin coating of a volatile oily liquid and subsequently an aqueous dispersion of rubber. No. 2,050,239. Raymond W. Albright and Andrew Szegvari, Akron, Ohio, to American Anode Inc., Akron, Ohio.

An improved mold dressing for coating molds used in casting deoxidized and oxygen-free copper, consisting of approximately three pounds bone ash or bone black and one pound of rosin dissolved in one gallon of alcohol. No. 2,050,375. Frank F. Poland, Highland Park, N. J., to American Smelting and Refining Co., N. Y. City.

A process of combining three or more layers of web materials by means of an aqueous adhesive of non-waterproof nature composed of water and gelatine glue which sets at atmospheric temperature. No. 2,050,382. Thomas Rowbotham, Bramhall, and William Shaw, Stockport, England.

Method of reinforcing insoles by use of cellulose ester fabric which can be cemented to the insole by means of cement formed from the cellulose ester of the material. No. 2,050,396. Max W. Tetlow, Boston, to U. S. Shoe Machinery Corp., Paterson, N. J.

An adhesive electrical insulating petrolatum wax prepared from Salt Creek crude oil, which melts between 142° F. and 159° F., and will adhere to polished surfaces, at temperatures as

(Specialty Patents continued on next page.)

376,646
PALEMID

376,647
LUBRAVION

376,788
ECONOMY OHI GAS CLEANLINESS
COOK AND HEAT WITH NATURE'S COOKING FUEL

376,791
BREEZOL

376,794
635R

376,805
STARCOR

376,880
CON TROL
Control Your Concrete

377,062
PHOENIX FLAMEPROOF PRODUCTS CORPORATION

377,158
MESCO Surgucul

377,171
BOB-N

377,137
SKETOLENE

377,271
GULF

377,481
MAGIC MOSOLITO
SALLADE & CO.

377,587
KWIK-GAS
INSTANT HEAT

377,596
STIXSO

378,082
REZENE

377,677
MERIT
Merit Beaver
BEAVER · DYED · CONEY

378,151
RAYLIG

378,156
GARGOYLE

378,157

378,205
Halco
WHITE SOAP CHIPS

378,348
AIR-SPEED

378,360
EAGLE

378,371
OSMOTAS

Descriptions

376,646. Societe Commerciale des Produits du Petrole, Paris, France; filed Mar. 31, '36; for heavy lubricating oil; use since Dec. 21, '34.

376,647. Societe Commerciale des Produits du Petrole, Paris, France; filed Mar. 31, '36; for heavy lubricating oil; use since Jan. '35.

376,788. Miami Bottled Gas, Inc., Miami, Florida; filed Apr. 6, '36; for natural hydrocarbon gas (a bottled cooking gas); use since Mar. 15, '35.

376,791. Breeze Corporations, Inc., Newark, N. J.; filed Apr. 4, '36; for motor fuel oil; use since Nov. 15, '35.

376,794. Breeze Corporations, Inc., Newark, N. J.; filed Apr. 4, '36; powdered compound for manufacture molded articles; use since Mar. 15, '34.

376,805. International Cement Corp., New York City; filed Apr. 4, '36; for Portland cement; use since Mar. 19, '36.

376,880. Control Products Co., Philadelphia; filed Apr. 6, '36; chemical liquid for use instead of water for mixing Portland cement to control setting time of the cement; use since Feb. 6, '36.

377,062. Phoenix Flameproof Products Corp.; New York City; filed Apr. 10, '36; for chemical fireproofing and flame extinguishing material; use since Apr. 2, '36.

377,158. Medical Soap Co., New Orleans, La.; filed Apr. 13, '36; for germicidal soap; use since Nov. 26, '28.

377,171. Sherwin-Williams Co., Cleveland, Ohio; filed Apr. 13, '36; for paints and paint pigments; use since Feb. 18, '36.

377,137. Frederick Phillips Case, Munising, Mich.; filed Apr. 13, '36; for mosquito and other insect repellent; use since June 1, '35.

377,271. Gulf Oil Corporation of Pennsylvania, by change of name to Gulf Oil Corp., Pittsburgh, Pa.; filed Apr. 16, '36; for petroleum and its products, including waxes and lubricating greases; use since Oct. '20.

377,481. O. H. Simmons, Inc. (Sallade & Co.), New York City; filed Apr. 21, '36; for liniment and lotion for exterminating insects and treating insect bites; use since July 1, 1885.

377,587. Michigan Gases, Inc., Grand Rapids, Mich.; filed Apr. 24, '36; for compressed bottle gas; use since Aug. '35.

377,596. Philadelphia Quartz Co., Philadelphia; filed Apr. 24, '36; for silicate of soda (anhydrous, hydrated, or in solution sold as an adhesive); use since Apr. 13, '36.

378,082. I. F. Laucks, Inc., Seattle, Wash.; filed May 6, '36; for ready mixed, dry, paste, or powdered paints; use since Apr. 24, '36.

377,677. Feshbach & Ackerman, Inc., New York City; filed Apr. 27, '36; for fur skins dyed in imitation of seal; use since Feb. 15, '33.

378,151. Rainier Pulp & Paper Co., San Francisco; filed May 7, '36; for lignin; use since Jan. 18, '36.

378,156. Socony-Vacuum Oil Co., Inc., New York City; filed May 7, '36; for cleaning window glass, textiles, painted and lacquered surfaces; use since Apr. 17, '36.

378,157. Socony-Vacuum Oil Co., Inc., New York City; filed May 7, '36; for lubricating oils and greases; use since June 15, '34.

378,375
MILKY WAY
379,376
5 point
378,400
Starcor
378,437
TYLOSE
378,453
SUR-RUG
INSURES RUGS FROM SLIPPING
378,460
SUGARFOS
378,501
SANILAC
378,528
RISLONE
378,576
SANIPHONE
378,580
AMBREX
378,585
VAR-SOLV-O
378,635
PERKINS COLDIDE GLUE
378,742
PER-CLENE
378,805
GLOLUBE
378,806
SV
378,811
KRAKEL
378,825
Klingtite
378,871
NEWERKING
378,942
Uniflo
378,946
SANI STERIL PROCESSED
378,971
CARAVAN
378,980
POWERSTEEL
379,063
SMOOTH-ON
379,067
dag
379,093 and 379,095
HUMBLE

Descriptions

378,205. Halle Bros. Co., Cleveland; filed May 8, '36; for soap chips; use since May '33.

378,348. Ruggles-Jackson Co., Amarillo, Texas; filed May 11, '36; for gasoline; use since Mar. 12, '35.

378,360. Eagle-Picher Lead Co., Cincinnati, Ohio; filed May 12, '36; for flatting, reducing and linseed oils; use since Nov. 15, '26.

378,371. Osmotas Sanitary Service, Ltd., Bristol, England; filed May 12, '36; for disinfectants and deodorants; use since Nov. '34.

378,375. Standard Leather Co. (Gable Labs.) Jacksonville, Fla.; filed May 12, '36; for shoe polish; use since Feb. 14, '36.

379,376. Fisk Rubber Corp., Chicopee Falls, Mass., filed June 6, '36, for uncured camelback rubber stock for use in tire repairing; use since June 19, '35.

378,400. International Cement Corp., New York City; filed May 13, '36; for Portland cement; use since Mar. 19, '36.

378,437. Kalle & Co. Aktiengesellschaft, Wiesbaden-Biebrich, Germany, filed May 14, '36; for cellulose esters and ethers and products derived therefrom for use in industrial arts; use since Dec. 16, '31.

378,453. Sambo Dairy Products, Inc., Brooklyn, N. Y.; filed May 14, '36; for liquid rubber in ammonia solution applied on back of rugs to prevent slipping; use since Feb. 28, '36.

378,460. Sucro-Blanc, Inc., New York City; filed May 14, '36; for defecants such as monocalcium phosphate and water soluble phosphates for treatment of sugar solutions; use since May 22, '35.

378,501. Socony-Vacuum Oil Co., Inc., New York City; filed May 15, '36; for oil compositions for dressing harness and leather goods; use since Jan. 31, '36.

378,528. Shaler Co., Waupun, Wis.; filed May 16, '36; for lubricating oil, motor gum solvent, and compounding material for lubricating oils and greases; use since June '30.

378,576. Wm. Ray McDonald (Saniphone Service, Ltd.), Vancouver, B. C., Canada; filed May 18, '36; for fluids for disinfecting telephones; use since Oct. 12, '32.

378,580. New York Color & Chemical Co., Inc., Belleville, N. J.; filed May 18, '36; for ready mixed, paste and powdered paints and for lacquers; use since Oct. 1, '32.

378,585. Mary B. Roberts, Chicago; filed May 18, '36; for varnish remover; use since Apr. 15, '36.

378,635. Perkins Glue Co., Lansdale, Pa.; filed May 19, '36; for glue; use since Feb. 24, '36.

378,742. E. I. du Pont de Nemours & Co., Wilmington, Del.; filed May 22, '36; for dry cleaning fluid; use since July 23, '34.

378,805. Skidmore Home Oil, Inc., Kansas City, Mo.; filed May 23, '36; for gasoline, lubricating oils and greases; use since May 2, '36.

378,806. Socony-Vacuum Oil Co., Inc., New York City; filed May 23, '36; for lubricating oils, greases and cutting oils; use since June 14, '34.

378,811. Wilson & Geo. Meyer & Co., San Francisco; filed May 26, '36; for sulfate of ammonia used as a fertilizer; use since Mar. 11, '32.

378,825. Calumet Refining Co., Chicago; filed May 25, '36; for lubricating oils and greases; use since Apr. 20, '36.

378,871. Newerking Cleaning Fluid Co., Inc., New York and Long Island City, N. Y.; filed May 25, '36; for dry cleaning fluids; use since Feb. 24, '36.

378,942. Benj. Kosperg Co. (Uniflo Paint & Varnish Co.), Elizabeth, N. J.; filed May 27, '36; for paints, varnish, shellac, bronze liquid, driers, stains, fillers, prepared oils for mixing and thinning paints, and turpentine; use since Jan. 2, '36.

378,946. Neva-Wet Corp. of America, Inc., New York City; filed May 27, '36; processing fluid for treating textiles, furs, cellulose, paper, and fibrous materials to render them germ proof; use since Mar. 15, '35.

378,971. Caravan Products Co., Washington, D. C.; filed May 28, '36; for ink and stain eradicator; use since Apr. 2, '36.

378,980. Detroit Electric Furnace Co., Detroit; filed May 28, '36; for tool steel; use since Mar. 1, '36.

379,063. Smooth-On Mfg. Co., Jersey City, N. J.; filed May 29, '36; for iron compounds in form of powder and paste; use since Oct. 30, '11.

379,067. Acheson Colloids Corp., Port Huron, Mich.; filed June 1, '36; for organic or inorganic chemicals in colloidal or fine particle state, for uses in the industrial arts; use since June 30, '10.

379,093 and 379,095. Humble Oil & Refining Co., Houston, Texas; both filed June 1, '36. 379,093 for metal polishes, detergents for glass, porcelain and similar surfaces, wood and solvents for detergents; use since Feb. 10, '36. Number 379,095, for sealing compounds for pipe joints; use since Sept. 14, '32.

Specialty Patents (Continued)

low as 32° F., without contracting. No. 2,050,428. Sterling H. Diggs, Robert E. Beard, and James M. Page, Jr., Casper, Wyo., to Standard Oil Co., Chicago.

Production of a photographic material consisting of a support, a light sensitive silver halide emulsion, and an anti-halation layer containing a binding agent and a water insoluble azo dye. No. 2,050,588. Wilhelm Schneider, Dessau, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Production of a web having a coating of granular abrasive material attached to the surface. No. 2,050,992. Joseph B. Aust, Niagara Falls, to Carborundum Co., Niagara Falls.

Production of substance containing soluble mineral salts, soluble carbonates, and assimilable nitrogenous substances by treatment of protein rich plant material including soya bean meal, cotton seed meal, and lupin seed. No. 2,051,017. Robert Schwartz, White Plains, and Stephen Laufer, Brooklyn, N. Y.

A compound consisting of corn paste and acacia gum used for treating and binding together layers of felt or similar heat insulation material. No. 2,050,089. James P. Doyle, Santa Cruz, Calif., one-half to Ernest E. Westergreen, Oakland, Calif.

Coating foods preparatory to smoking with mixture consisting of emulsion of disintegrating waste animal substances, castor oil, and glycerine. No. 2,050,004. Georg Goren, Berlin, Germany, to Carl Cohn, Cologne, Germany.

Protection of combustible liquids stored in tanks by injection above the surface, of a gas of inferior quality of sustaining combustion. No. 2,049,987. Walter J. Willenborg, Weehawken, N. J., to U. S. Fire Protection Corp., Hoboken, N. J.

Production of a paving composition consisting of a mineral aggregate, bituminous cement, fluxing oil, and pulverized asphalt. No. 2,049,985. Bertrand H. Wait, New Rochelle, N. Y., and Ralph T. Haller, Plainfield, N. J.

Composition material adapted for use as a building tile, composed of magnesia lime, calcium sulfate, blast slag, silica quartz, pigment, and sodium sulfate. No. 2,049,882. George Witty, Long Island City, N. Y.

A solvent free ink in a dispersed state for printing fabrics coated with cellulose ester derivatives, consisting of pigment, drier, polyhydric alcohol-polybasic acid resin and drying oil. No. 2,049,507. Dorman McBurney and Edgar H. Nollau, Newburgh, N. Y., to du Pont.

Process of making a detergent from a cereal by hydrolyzing protein and starch components and appropriately treating resulting products. No. 2,049,476. Axel L. Sodergreen, Malverne, N. Y., to Herbert D. Pease, N. Y. City.

A wetting and sudsing agent formed from the reaction product of sulfur trioxide and a metallic chloride and an alcohol. No. 2,049,670. Arnon O. Snoddy and Wilfred S. Martin, Cincinnati, Ohio, to The Procter and Gamble Co., Cincinnati.

Specialty Patents concluded on next page.

379,114
DERBY

379,136
Plymouth
Hi-Glo

379,147
ANOLITE

379,148
Cyclo

379,149
MERASOL

379,151
PAIZONE

379,152
PICRIN

379,153
PYRATEX

379,159
PAINTER'S
DREAM

379,197
TI-PURE

379,199
CAMPHORNAPS

379,206
STAR

379,220
UNOBA

379,250
MASTER FOAM

379,317
Carxol

379,487
FILSULITE

379,488
SOLVANG

379,565
Phomaide

379,616
INSTO

379,617
MOULDENE

379,648
TRYTONE

379,800
Botana

379,819
BIG SHOT

379,822
E-Z-GRO

379,917
VITA

379,942
SKIDNO

379,967
SUPERIOR

379,971

OMNICIDE

380,003
ZEROGLOSS

380,031
MULTIFORM

380,041
RUBBO

380,066
LEADLEAF

380,105
REZON

380,106
REZONE

380,205
LITHOX

Descriptions

379,114. Kutol Products Co., Inc., Cincinnati, Ohio, filed June 1, '36; for wall paper cleaner; use since Apr. 27, '36.

379,136. Plymouth Wholesale Dry Goods Corp., New York City; filed June 1, '36; for floor wax; use since Jan. 3, '36.

379,147. R. R. Street & Co., Inc., Chicago; filed June 1, '36; for textile detergent; use since '28.

379,148. R. R. Street & Co., Inc., Chicago; filed June 1, '36; compound for removing stains from textiles; use since '27.

379,149. R. R. Street & Co., Inc., Chicago; filed June 1, '36; for dry cleaning compounds; use since May 26, '36.

379,151. R. R. Street & Co., Chicago; filed June 1, '36; compound for removing stains from textiles; use since '28.

379,152. R. R. Street & Co., Inc., Chicago; filed June 1, '36; compound for removing stains from textiles; use since '27.

379,153. R. R. Street & Co., Inc., Chicago; filed June 1, '36; compound for removing stains from textiles; use since May 19, '36.

379,159. Horace W. Wickham (Wickham Co.), Riverside, Mich.; filed June 1, '36; for paint cleaning powder; use since Apr. '34.

379,197. Krebs Pigment & Color Corp., Wilmington, Del.; filed June 2, '36; for paint pigments; use since May 13, '36.

379,199. Mabex Co., Philadelphia; filed June 2, '36; for insecticides; use since May 1, '35.

379,206. Philadelphia Quartz Co., Philadelphia; filed June 2, '36; for silicate of soda, either anhydrous, hydrated, or in solution; use since May 14, '36.

379,220. Union Oil Co. of California, Los Angeles; filed June 2, '36; for lubricating greases; use since Mar. 15, '36.

379,250. Geo. R. McIntyre (Master Foam Labs.), Dayton, Ohio; filed June 3, '36; for liquid fabric cleaner; use since Jan. 2, '33.

379,317. Hunley E. Seaton, El Centro, Calif.; filed June 4, '36; for petroleum products; use since Oct. 2, '35.

379,487. Solvang Diatomite Products & Engineering Co., Jersey City, N. J.; filed June 9, '36; for silica in powdered or brick form produced from diatomaceous earth; use since Apr. 1, '36.

379,488. Solvang Diatomite Products & Engineering Co., Jersey City, N. J.; filed June 9, '36; for silica in powdered or brick form produced from diatomaceous earth; use since Jan. 1, '36.

379,565. Pyrene Mfg. Co., Newark, N. J.; filed June 11, '36; for fire extinguishing solution; use since May 18, '36.

379,616. Insto Co., Los Angeles; filed June 12, '36; hand cleaning compound; use since Aug. '18.

379,617. International Pulp Co., New York City; filed June 12, '36; for preparation ground and pulverized minerals used in manufacture moulds for castings of metals, glass, and vitreous ware; use since Mar. 1, '19.

379,648. Henry R. Stanton (Trytone), Los Angeles; filed June 12, '36; for photographic chemicals; use since May 6, '36.

379,800. R. A. Jones & Co., Covington, Ky.; filed June 16, '36; for soap; use since May 15, '36.

379,819. Richard D. Van de Carr (All American Products Co.), Rochester, N. Y.; filed June 16, '36; chemical preparation for cleaning automobile radiators to prevent rusting and stop leaks therein; use since May 15, '36.

379,822. Atlantic Trading Corp., Inc., Somerville, N. J.; filed June 17, '36; for fertilizer; use since Apr. 1, '35.

379,917. Wolf Creek Soap Co., Dayton, Ohio; filed June 18, '36; for toilet soap; use since July, '33.

379,942. Roxanda Mines, Inc., St. Paul, Minn.; filed Feb. 17, '36; for asphaltic paving material; use since July 15, '35.

379,967. Mittag & Volger, Inc., Park Ridge, N. J.; filed June 19, '36; for inks—check protector, metal type, stencil duplicating, and hectograph fluid; use since Jan. '22 on check protector; since Jan. '30 on metal type; and since July 1, '34 on stencil duplicating and hectograph fluid inks.

379,979. Superior Chemical Products, Inc., Philadelphia; filed June 19, '36; for insecticide; use since Dec. 1, '35.

380,003. Johns-Manville Corp., New York City; filed June 20, '36; for bituminous paint; use since Mar. 20, '36.

380,031. Berry Bros., Detroit; filed June 22, '36; for varnishes, paint enamels, and lacquers; use since June 1, '36.

380,041. Daniel H. Donegan (American Printers Roller Co.), Chicago; filed June 22, '36; for tabbing, padding and bookbinders' cement; use since July 12, '35.

380,066. Metalead Products Corp., San Francisco; filed June 22, '36; for powdered and flaked lead compounds used in combination with an oil or other vehicle in paints; use since June 9, '36.

380,105. I. F. Laucks, Inc., Seattle, Wash.; filed June 23, '36; for ready mixed, dry, paste, or powdered paints; use since June 16, '36.

380,106. I. F. Laucks, Inc., Seattle, Wash.; filed June 23, '36; for ready mixed dry, paste, or powdered paints; use since June 18, '36.

380,205. International Printing Ink Corp., New York City; filed June 25, '36; for printing ink; use since Apr. 17, '36.

Specialty Patents (Concluded)

An aqueous soap composition containing sodium and triethanol soaps, a solution of resin and rubber, and some free triethanolamine. No. 2,049,618. Forrest J. Major, Ocean Park, Calif., by mesne assignments to The Run-Ban Co., Steubenville, Ohio.

Dispersing and emulsifying agents from marine animal oils obtained from processes for oil tanning skins. No. 2,049,512. Henry A. Piggott and George S. J. White, Blackley, Manchester, England, to Imperial Chemical Industries Ltd., England.

Method of making bituminous paving materials. No. 2,049,772. Donald M. Hepburn, Philadelphia, and Samuel S. Sadtler, Springfield Township, Montgomery County, Pa., by mesne assignment to Hepburnite Co.

Bituminizing felt containing unhydrated cellulose pulp and humidifying the bituminized felt to a moisture content of at least 5%. No. 2,049,978. Milton O. Schur and Walter L. Hearn, Berlin, N. H., to Brown Co., Berlin, N. H.

Process of making a container with translucent liquid proof windows by thinning fibrous material on side and end walls, impregnating thinned portions with penetrating liquid, and coating entire inner and outer surfaces with paraffin. No. 2,051,047. John M. Hothersall, Brooklyn, N. Y., to American Can Co., N. Y. City.

Preparation of a photographic material consisting of a silver-halide emulsion containing a selenoisocyanine. No. 2,051,134. Walter Dieterle and Walter Zeh, Dessau in Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y.

Method of making photographic mats. No. 2,051,161. Conrad G. Briel, Chicago, to Cinema Development Co., Chicago.

Production of an adhesive of the type of glue, starch, dextrin, and natural gums containing a dispersion of an alcohol and a reaction product of an alcohol and sulfuric acid. No. 2,051,184. Walter Schrauth, Berlin-Dahlem, Germany.

Composition for demulsifying cut oils, bottom settlings etc., consisting of a soap and an aldehyde or ketone addition product of an alkali hydrogen sulfite. No. 2,051,226. Harold J. Robertson, Tulsa, Okla., to Sinclair Refining Co., N. Y. City.

Preparation of a mineral wool by fusing a compound similar to calcium silicate and blowing a stream of such molten substance to form fibrous strands. No. 2,051,279. John T. Thorndyke, Los Angeles, one third to Alfred W. Knight, S. Pasadena, Calif.

Production of composition containing casein, lime, Canada balsam, isopropyl alcohol, and an aqueous solution of rubber latex. No. 2,051,338. Mone R. Issacs, Philadelphia.

CHEMICAL

NEWS & MARKETS

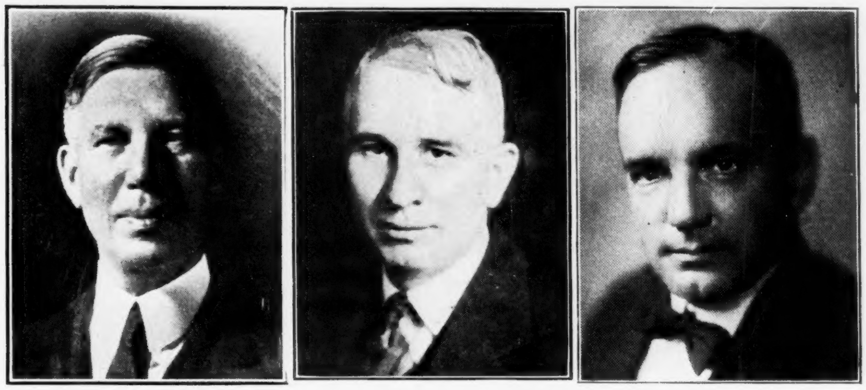
COURTESY CHARLOTTE OBSERVER

Cyanamid plans southern expansion

ACS CELEBRATES 60th ANNIVERSARY

Pittsburgh Meeting Hears Industrialists Discuss "What Industry Wants from Its Chemists"—Columbia Alkali Enters Liquid Chlorine Field—Detailed Plans of 3 Chemurgic Meetings Announced—

Research developments affecting the chemical industries were reported to the 92nd meeting of the A. C. S. in Pittsburgh during the week of Sept. 7th. Sessions on new metals and alloys, coal and wood, resins and plastics, the chemistry of steel, and other fields were addressed by chemists and industrialists of America and Europe. The future internationally of the chemical industry was a leading theme, and substitutes for natural resources were under discussion.



H. A. GALT DR. WALTER S. LANDIS DEAN FRANK C. WHITMORE

Prominent speakers at the Pittsburgh Symposium on "What Industry Wants from Its Chemists."

Dr. Friedrich Bergius, German chemist who received the Nobel Prize for his work in the liquefaction of coal, spoke on "Problems of Industrial Pioneer Work" Wednesday, Sept. 9th, which was designated "Central Day." Dr. Edward F. Armstrong, president of the British Chemical Manufacturers, and Dr. John Johnston, director of research of the U. S. Steel Corp., were the other speakers.

B. D. Saklatwalla, president of U. S. Rustless Steel and Iron, opened the metal symposium Thursday morning with an address on "Fundamentals Governing the Practical Evolution of New Metals." R. J. McKay of International Nickel discussed "Nickel and Nickel Alloys." W. J. Priestley, Electro Metallurgical, presented a paper on "Chromium and Its Alloys in the Chemical Industry." Florence Fenwick of U. S. Steel in collaboration with Dr. Johnston addressed the session on "Steels' Resistance to Corrosion and Scaling."

Speakers at the afternoon session included: William L. Fink, Aluminum Co. of America, "Aluminum and Aluminum Alloys for Chemical Apparatus"; G. O. Hiers, National Lead, "Lead and Lead Alloys"; James A. Lee, *Chem. & Met.*, "Silver and Precious Metals"; and D. K. Crampton, Chase Brass and Copper, "Developments in Wrought Copper Base Alloys."

A civilization with metallurgy as its foundation is being built by science, according to Dr. Saklatwalla, who predicted that chemical technology, aided by metallurgy, will influence the industries and the arts to an extent which at present it is impossible to fathom.

"A very striking feature of the newer metallurgical development is the use of rare elements for alloying with common metals, producing a material of nobler characteristics," he stated. "Remarkable advancement has been brought forth in our civilization by utilizing the element chromium in the production of stainless steel."

Papers by Dr. F. S. Sinnatt, director of fuel research for the Department of Scientific and Industrial Research of Great Britain, and Dr. M. Pier, research director of the I. G., were read at a session on hydrogenation of coal attended by fuel experts from all over the country.

Dr. T. E. Warren and Dr. R. E. Gilmore of the Fuel Research Laboratories of the Canadian Dept. of Mines presented a paper before the Gas and Fuel Division. Prof. Nevil V. Sidgwick of the University of Oxford, England, addressed the Division of Physical and Inorganic Chemistry. Prof. Sidgwick is president of the Chemical Society, chairman of the Chemical Research Board and past president of the Faraday Society.

The symposium on synthetic resins and plastics brought forth information which for many years has been confined to the laboratories from which it originated, according to S. S. Kistler, of Norton Co., Worcester, Mass., chairman of the Colloid Division.

"An immense number of preparations with widely varying properties have been produced, many of which have found such extensive application as to be considered prime necessities, and yet there is little understanding of their chemistry outside the laboratories where they are produced, and often not even there," Mr. Kistler explained.

"The time is now ripe for intensive collective efforts to explain and clarify what is now known, with the hope of laying a scientific foundation upon which to build the new and superior products of the future."

Papers at this symposium were read by the following: B. W. Nordlander, G. E.; E. R. Littmann, Hercules Powder; S. Maner Martin, Jr. and J. C. Patrick, Thiokol Corp.; Alfred J. Stamm, R. M. Seborg, E. Bateman, E. Berlinger, J. P. Hohf, E. C. Sherrard and H. D. Tyner, Forest Products Laboratory; C. A. Thomas and F. J. Soday, Thomas & Hochwalt Laboratories; G. M. Kline and B. M. Axilrod, Bureau of Standards; K. G. Blaikie and R. N. Crozier, Shawinigan Chemicals, Ltd.; S. D. Douglas and W. N. Stoops, Carbide and Carbon; H. R. Dittmar, du Pont.

Educators and industrialists gathered at a symposium on Thursday, Sept. 10th, to discuss "What Industry Wants of Its Chemists." Aim of the symposium was to bring about a better adjustment of technical school training to the needs of employers. Among the speakers were: H. A. Galt, Pittsburgh Plate Glass, Barberton, O.; W. S. Landis, Cyanamid; F. W. Willard, Nassau Smelting and Refining; Dean Frank C. Whitmore, Penn. State; E. F. du Pont, du Pont personnel manager.

Closer relations between industry and the colleges, whereby the student would gain a better insight of the world that lies beyond the diploma, were urged by Mr. du Pont. "I believe," said Mr. du Pont in part, "that the college graduate should understand better the modern industrial society with which he is destined to become affiliated. He should be told more specifically what goes on in the research laboratory, in the factory, and on the sales firing line. From contacts each year with hundreds of these young men," continued Mr. du Pont, "it appears that they concentrate too much on winning a diploma, and not enough on the things that lie beyond the diploma. Their pursuit of theory would be more profitable and interesting if they gained earlier in their course an appreciation of the ways in which theory is applied, thus shortening the orientation period when entering industry." Mr. du Pont said further that the young graduate comprehends too little of the economic

aspects of his work. "It is still true," he said, "that industrialists must think in terms of income and outgo, in terms of sales revenue and costs. The student can hardly learn too soon that the dollar sign is an unwritten but potent factor in every industrial chemical equation."

Mr. du Pont also stressed loyalty as a necessary quality in the industrial chemist, saying, "The young graduate takes an extremely important step when he becomes associated with a business. Therefore, he should investigate the prospective business at least as carefully as he in turn is investigated, and he should be satisfied that it merits his loyalty and respect and is likely to afford ample outlet for his abilities. His loyalty to his employer is a large factor in subsequent promotion to positions of trust." Accuracy, ability to speak and write effectively, and a cooperative attitude were other attributes expected of industry's chemists, said Mr. du Pont.

Division of Petroleum Chemistry, of which F. W. Hall, chief chemist, Texas Co., was chairman, held 2 sessions on the opening day. A symposium on food processing and preservation was held by the Division of Agriculture and Food Chemistry, headed by J. H. Nair of the Borden Co.

Other sessions dealt with cellulose, fertilizers, industrial and engineering chemistry, microchemistry, paint and varnish, sugar and rubber.

Columbia in Chlorine

In line with the progressive policy characteristic of Columbia Alkali, and in response to persistent demands on the part of customers and other friends of this well-known, wholly owned subsidiary of Pittsburgh Plate Glass, comes the interesting announcement that liquid chlorine and electrolytic caustic soda have been added to the products of this concern. Already, a complete, new plant, modern to the last detail, has been finished and shipments are now being made in single and multiple tank cars, and in 100 and 150 lb. cylinders.

Although the new chlorine plant is located on the Company's extensive property holdings at Barberton, Ohio, it is well removed from other plant operations. Every benefit of scientific development; every manufacturing refinement; have been employed in connection with this plant. Latest type of equipment was selected down to the most minute detail. Behind the plant stand years of careful preparation; the enlistment of foremost specialists; extensive research. Greatest care has been taken to protect the operators in the plant and users of the product from hazard. Equally great care has been taken to prevent variation, which has been reduced to a minimum.

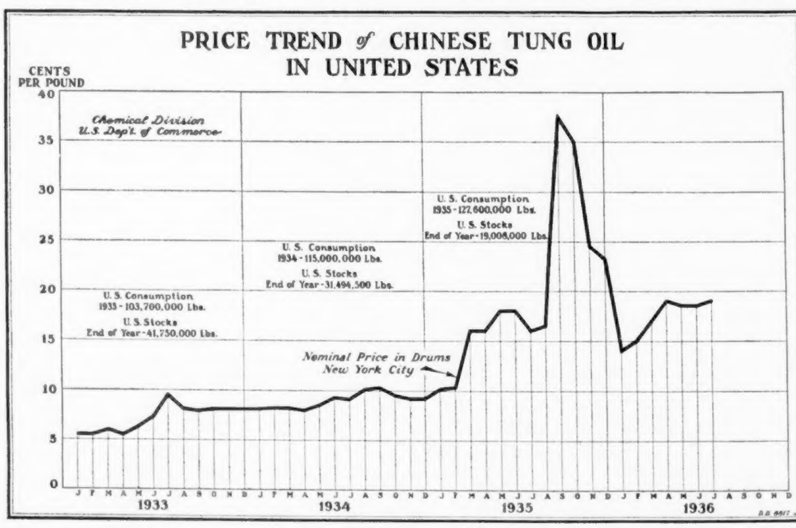
Importance of Chlorine in Industry

Importance of liquid chlorine is increasing rather than diminishing. It is indispensable to a wide variety of industries. Leading uses of liquid chlorine include water purification and sewerage disposal; bleaching of pulp and paper; the finishing processes of many textiles; and as a raw material in the production of many industrial chemicals. Anticipating a steadily mounting demand for Columbia chlorine the officers of the Company have made provision for expanding production facilities by units at this modern plant.

For nearly half a century Columbia Alkali has been a leading factor in the production of soda ash, caustic soda, and byproducts. It was an altogether logical and natural development that chlorine should be added to the line. Executive offices of Columbia, located in the fresh air of the 43rd floor of 30 Rockefeller Plaza (Radio City), N. Y. City, reflect in design and equipment the modern spirit of the organization. Branch sales offices are maintained at Chicago, Pittsburgh, Cincinnati, and at the plant in Barberton.

Chemurgic Meetings Scheduled

Three Regional Chemurgic Conferences, covering a wide field of agricultural-industrial crops in the South and Northwest, have been announced as a part of the Farm Chemurgic Council's fall program. First of this series of sectional meetings will be held at Lafayette, La., Oct. 15, 16 and 17th. It will be known as the Southern Chemurgic Conference. Second meeting will be held during the following week, Oct. 20 and 21st, at Pensacola, Fla., under the title of Gulf Coast Chemurgic Conference. A third Conference will be held at Spokane, Wash., Nov. 12 and 13, under the direction of the State Planning Councils of 4 Northwestern states.



Users of tung oil will long remember the "squeeze" in prices of last fall, and one of the Chemurgic meetings will largely be devoted to discussion of domestic development of tung oil supplies.

The Southern Chemurgic Conference at Lafayette has been organized by the Chambers of Commerce of Beaumont, and Lafayette, La., with the Farm Chemurgic Council and the Chemical Foundation cooperating. Twenty-five organizations will join hands in making the meeting a success.

The 2-day meeting at Pensacola will cover a wide variety of chemurgic subjects. Naval stores and the new Southern paper industry will occupy a large part of the 1st day's program. Dr. Charles H. Herty, inventor of the process by which newsprint and white paper are now made from Southern pines; several representatives of the naval stores industry, authorities from the Dept. of Agriculture and southern colleges, industrialists and executives of the Farm Chemurgic Council will participate in the general program.

Dr. C. C. Concannon, chief of the chemical division, Bureau of Foreign and Domestic Commerce, will lead the concluding programs of the Gulf Coast Conference. They will be devoted to the study of American tung oil production and development of new uses. Dean Harold Mowry, College of Agriculture of the University of Florida, and committees from tung oil producing states will take part.

Another feature of the Conference will be a detailed tung oil exhibit with comparisons of American tung oil and imported brands and displays of many new uses for the American product. It is planned to have a miniature tung oil extracting plant in operation. J. C. Adderly, president of the American Tung Oil Association of Pensacola, is directing organization of the Gulf Coast Conference with the Chemical Foundation and the Farm Chemurgic Council assisting.

Organization plans for the Northwestern Chemurgic Conference are nearing completion and the sessions of this Con-

ference will be held at Hotel Davenport, Spokane, Wash., on Nov. 12 and 13th. Planning Councils and other organizations of the 4 states of Idaho, Montana, Oregon and Washington are aiding in drafting the 2-day program. Dr. Rudolf A. Clemen, of Seattle, has been named general chairman of the Conference committee. A smaller executive committee has also been selected to handle the details of the Conference. The members are Dr. Clemen, chairman; Dr. H. K. Benson, of the University of Washington; B. H. Kizer, chairman of the Washington State Planning Council; Dr. H. E. Barnard, director of research of Farm Chemurgic Council; R. F. Bessey, of Portland, Ore.; and P. Hetherton, secretary.

Du Pont to Release Educational Sound Picture

Plaskon Absorbs Unyte—Dow Establishes Consulting Engineering Division—Columbian Carbon Seeks Exemption from Public Utility Holding Act Provisions—Other News of the Companies—

Du Pont announces that it has released for public showing an educational sound motion picture entitled "The Wonder World of Chemistry." Although the present showings will be confined to Wilmington and to the Company's exhibit at the Texas Centennial Central Exposition in Dallas, it is understood that the picture will soon be available for general distribution.

Picture is said to be the only production of its kind, and among the hundred and more shots are many types of chemical operations never before recorded for public view. Research chemists and operators are shown engaged in their daily work in the du Pont laboratories and factories. Included in the picture are such operations as the fixation of nitrogen from the air; the synthesis of a rubber-like substance from coal, limestone, and salt; derivation of dyes and perfume materials from coal tar; transformation of natural cellulose from cotton and wood into rayon and transparent cellulose film; making of plastics, coated fabrics, and finishes from cotton and vegetable oils.

Du Pont officials are reported to have authorized the picture because of an increasing demand on the part of educational institutions, scientific societies, and business men's clubs for information about the Company and about the chemical industry in general.

Plaskon's Expansion

Merging of the business of the Unyte Corp. with that of Plaskon was announced Aug. 6th. New company, which will be the world's largest producer of urea formaldehyde resins, will be known as the Plaskon Co., Inc., a Delaware corporation. Its officers will be those of the Plaskon Co.: James L. Rodgers, Jr., president; Horton Spitzer and R. B. Harrison, vice-president; C. O. Marshall, secretary, and W. R. Feldtmann, treasurer. Directors will be H. D. Bennett, president of the Toledo Scale Co.: W. P. Pickhardt, former president of Untye, and J. L. Rodgers, Jr.

This new alignment is the 1st consolidation in the plastics industry for many years. The new concern takes over all processes and patent rights formerly held by Unyte.

New Consulting Service

A consulting engineering division has been established by Dow Chemical with the purpose of affording its customers reasonably priced engineering services thoroughly schooled in the most efficient application of existing or future Dow products. New division will also provide service for the development of equipment for the industrial use of Dow products.

Headquarters of the Dow consulting engineering division are at 204 Nickels Arcade, Ann Arbor, Mich. Director of the service is Prof. W. L. Badger, of the University of Michigan.

Division is exclusively a service agency and it will not manufacture either materials or equipment.

Company Briefs

Columbian Carbon has applied to the SEC for exemption from the provisions of the Public Utility Holding Co. Act of '35; Read Phosphate of Savannah has purchased the G. Ober & Sons' plant in that city; but will retain the name and personnel; a new company, Magnesol

COMING EVENTS

American Chemical Society. Semi-Annual Meeting, Pittsburgh, Sept. 7-12.

World Power Conference, Washington, D. C., Sept. 7-12.

American Soy Bean Association, 16th Annual Convention, Iowa State College, Ames, Sept. 14-17.

Tanners' Council, Waldorf-Astoria, N. Y. City, Sept. 14-15.

California Sewerage Works Association, Santa Monica, Calif., Sept. 14-17.

National Petroleum Association, 34th Annual Meeting, Hotel Traymore, Atlantic City, N. J., Sept. 16-18.

Annual Convention of Photo-Lithographic Industry, Atlantic City, N. J., Sept. 18-20.

Family Party, National Association Textile Dyers & Finishers, Warwick Club, Providence, Sept. 20.

American Water Works Association, Rocky Mountain Section, Cosmopolitan Hotel, Denver, Colo., Sept. 21-23.

New England Water Works Association, Annual Convention, Hotel Pennsylvania, N. Y. City, Sept. 22-25.

Textile Analysts, Designers & Technicians Association, 3rd meeting, Bradford Durfee Textile School, Fall River, Mass., Sept. 28.

Atlantic Coast Premium Exposition, Hotel Astor, N. Y. City, Sept. 28-Oct. 2.

American Mining Congress, Metal Mining Division, Denver, Sept. 28-Oct. 2.

Public Works Congress (American Society of Municipal Engineers and I. A. P. W. O.), Royal York Hotel, Toronto, Sept. 28-Oct. 1.

Annual Metal Mining Convention and Exposition, Denver, Colo., Sept. 28-Oct. 2.

Annual Convention of American Photo-Engravers Association, Hotel Statler, Boston, Oct. 1-3.

Master Brewers Association of Am., Philadelphia, Oct. 4-7. H. Sturm, 30 Magee st., Rochester, N. Y.

National Safety Council, 25th Annual Safety Congress, Atlantic City, N. J., Oct. 5-9.

National Restaurant Association, Furniture Mart, Chicago, Oct. 5-9. F. J. Weffler, 666 Lake Shore Drive, Chicago.

Industrial Materials Exhibit, Hotel Roosevelt, N. Y. City, Oct. 5-10.

Los Angeles Rubber Group, A. C. S., Oct. 6.

5th National Road Oil and Asphalt Congress, Tulsa, Okla., Oct. 8-9.

Electrochemical Society, Semi-Annual Meeting, Niagara Falls, N. Y., Oct. 8-10.

Ohio Ceramic Industries Association, Annual Fall Meeting, Columbus, Ohio, Oct. 9-10.

N. Y. State Sewerage Works Association, Fall Meeting, Geneva, N. Y., Oct. 9-10.

National Dairy Association, Dallas, Texas, Oct. 10-18. Lloyd Burlingham, 1508 Chicago Mercantile Exchange Bldg., Chicago.

National Association of Lubricating Grease Manufacturers, Stevens Hotel, Chicago, Oct. 12-13.

Tanners' Council Fall Meeting, Palmer House, Chicago, Oct. 14-15.

Pennsylvania Water Works Association, Hotel Haddon Hall, Atlantic City, Oct. 14-16.

Southern Chemurgic Conference, Lafayette, La., Oct. 15.

National Metal Congress and Exposition, Cleveland, Oct. 19-23.

Gulf Coast Chemurgic Conference and National Tung-Oil Meeting, San Carlos Hotel, Pensacola, Fla., Oct. 20-21.

American Public Health Association, New Orleans, La., Oct. 20-23.

National Association of Exterminators & Fumigators, Annual Convention, Cleveland, Oct. 26-28.

National Hotel Exposition, Grand Central Palace, N. Y. City, Oct. 26-30.

American Gas Association Convention, Atlantic City, N. J., week of Oct. 26.

National Oil Marketers Association, Annual Convention and Trade Exhibit, Stevens Hotel, Chicago, Oct. 27-29.

American Petroleum Institute, Annual Meeting, Chicago, Nov. 9-12.

National Association Practical Refrigerating Engineers, Stevens, Chicago, Nov. 10-13.

International Acetylene Association, 37th Annual Convention, Jefferson Hotel, St. Louis, Mo., Nov. 18-20.

American Institute of Chemical Engineers, Annual Convention, Lord Baltimore Hotel, Baltimore, Md., Nov. 11-13.

Federation of Paint and Varnish Production Clubs, Annual Convention and Paint Show, Drake Hotel, Chicago, Nov. 15-17.

National Paint, Varnish, and Lacquer Association, Annual Convention, Drake Hotel, Chicago, Nov. 18-20.

American Society of Mechanical Engineers, Annual Meeting, N. Y. City, Nov. 30-Dec. 4.

National Exposition of Power and Mechanical Engineering, Grand Central Palace, N. Y. City, Nov. 30-Dec. 5.

Independent Petroleum Association, Annual Meeting, Biltmore Hotel, Oklahoma City, Okla., Nov. 30-Dec. 1.

American Association Textile Chemists and Colorists, Annual Meeting, Providence, R. I., Dec. 4-5.

1st International Consumers' Petroleum Exposition, Convention Hall, Detroit, Mich., Dec. 5-13.

National Association of Dyers and Cleaners, 30th Annual Convention, Netherland-Plaza Hotel, Cincinnati, Ohio, probably Jan. 25-28, '37.

American Society for Testing Materials, Regional Meeting, Palmer House, Chicago, Mar. 1-5, '37.

American Ceramic Society, Annual Meeting, Waldorf-Astoria, N. Y. City, week of Mar. 21, '37.

12th Southern Textile Exposition, Textile Hall, Greenville, S. C., Apr. 5-10, '37.

International Association for Testing Materials, 2nd International Congress, London, Apr. 19-24, '37. K. Headlam-Morley, 28 Victoria st., London, S. W. 1.

American Society for Testing Materials, 40th Annual Meeting, Waldorf-Astoria, N. Y. City, June 28- July 2, '37.

"Achema VIII," Plant exhibition, in connection with 50th General Meeting of Verein Deutscher Chemiker, Frankfurt, Germany, Sept., 1937.

Exposition of Chemical Industries, Grand Central Palace, N. Y. City, Dec. 6-11, '37.

Co., will make magnesium silicate at South Charleston, W. Va., in a $100,000 plant located on ground leased from Westvaco.

Tennessee Corp.'s sulfuric output will be increased 50% with the acquisition of Ducktown Chemical; U. S. I.'s anti-freeze advertising will be increased 40% over last year, with the hope of inreasing sales 25%; Catalin's sales of cast phenolics were 30% ahead for the 1st 7 months; United Dyewood's "lab" has developed a new type of printing ink, a new synthetic dye for rayon, and a new low cost paint for automobiles; Pfister Chemical is appealing recent conviction of maintaining a nuisance at its Ridgefield, N. J. plant.

Kaolin, Inc., Indianapolis, Ind., was recently formed to operate kaolin mines; Davison Chemical has filed suit asking dissolution of Silica Gel; Celluloid Corp. has redesignated its various sales divisions to allow for the additional products now sold by the company; Thompson Chemicals, Inc., Springfield, Mass., petitions for dissolution.

Arthur C. Trask Co., 4103 S. LaSalle st., Chicago, is sales agent for Allied Industrial Alcohol of N. Y. Stocks will be carried in Chicago and William J. Mitchell is in charge of sales.

William R. Rogers who has been selling in the Gloversville, N. Y. section since '18 (1st with Innis, Speiden and then with Ritter Chemical) will now operate his own plant and selling force. Stocks will also be carried at Salem and Peabody for the leather trade.

Ionic Industries, Bremond, Tex., will start within a few weeks operation of one of the largest feldspar, china clay and Fuller's earth mines in the U. S. C. H. Geist of Philadelphia is president of the new company and Walter Holland is vice-president.

16,300 Attend Du Pont's Deepwater Plant Outing

Merck Holds Open House in New Administration Building—Important Plant Expansion Programs Announced—Two Companies Grant Vacations with Pay—Additional Notes on Plant Activities—

Outing of du Pont's executive offices, held in July, attracted over 3,000. Just a mere handful, however, compared to the 16,300 who attended the picnic of the Deepwater, N. J. plant at Riverview Beach Park, Pennsville, N. J. on Aug. 15th. Departments which could not be halted were operated with a small skeleton force. A bathing beauty contest, track sports and a baseball game with the company's Gibbstown plant were some of the features. Headed by J. J. Carrigan, chairman, the following were members of the committee on arrangements; J. C. Maguire, W. C. Brothers, F. J. O'Connor, A. L. Parmalee, H. C. Gilman, Ward Weatherby, W. A. Clair, J. H. Barnhill, and W. L. Pritchett.

George Merck is Host

President George W. Merck was host on Aug. 12th to several hundred guests at an inspection of the new $200,000 administration building just completed. See Rotogravure Section this issue.

Construction Plans

Announcements of new plants and additions to existing ones are prominent in the news of the month. Among the companies reporting plans for new factories are: Carbide with the erection of a $250,000 plant near Catlettsburg, Ky., to be used to condense natural gas into liquid form for shipment by pipe line to the South Charleston works and to be ready Apr. 1, '37; Varcum Co., Niagara Falls resin producer, a new building. Those reporting plant additions were: Mac Lac, Rahway, N. J., shellac producer; Naugatuck Chemical with an $8,500 addition at Naugatuck, Conn.; Carbide reporting a new furnace building at Niagara Falls; U. S. I. a $10,000 experimental laboratory and a $4,000 brick washer building; Heyden Chemical a 4-story addition at Garfield, N. J., to cost $40,000; du Pont a $175,000 addition at Grays Ferry plant in Philadelphia.

Larry Gering, Inc., dealers in waste cellulose, is said to have selected a new plant location between Rahway and Westfield, N. J. From Charleston, S. C., comes the report that the Branchville Chamber of Commerce is negotiating with the Chemical Foundation looking towards the erection of a power alcohol plant using sweet potatoes as the raw material.

According to newspaper reports, Grasselli will spend approximately $75,000 at the Paulsboro, N. J., plant. During the major part of the depression the plant has been closed. Cyanamid announced it will double its plant and warehouse space at Charlotte, N. C.* Schaefer Varnish, Louisville, has taken over a larger plant formerly used by Sun Varnish.

Vacations with Pay for Workers

Two companies announced last month vacation plans for workers—The 600 National Aniline & Chemical employees at the Buffalo plant will receive a week's vacation with pay, while Chester F. Hockley, president of Davison Chemical, announced a plan for employees who have worked 1,000 or more hours during the current year.

Fires Reported Last Month

Twenty were hurt on Aug. 26th in a fire in the still house of Publicker's Philadelphia plant; twenty employees of Reilly Tar & Chemical escaped injury on Aug. 28th when a still exploded at the Indianapolis plant; Explosion of a synthetic resin mixing tank at the San Francisco plant of Beck, Koller caused $150,000 worth of damage on Aug. 11th; Western Sulphur had 2 fires last month at its San Pedro plant with a combined loss of $33,000; 2 research workers at Commercial Solvent's research "labs" in Terre Haute were injured Aug. 19th when tank of nitro-paraffin exploded.

Plant Dinners Last Month

Carbide & Carbon officials at Charleston attended a banquet tendered to the safety classes on Aug. 28th; John B. Flynn, superintendent of Hooker's Tacoma plant, who is in Niagara Falls on his honeymoon, was given a dinner on Aug. 12th by his former associates at the Niagara Falls plant of the company.

Obituaries

Walter A. Layfield, 64, a retired vice-president of Atlas Powder, died following an operation for appendicitis on Aug. 10th. He had been identified with the explosives industry for years, 1st with Repauno Chemical and later with du Pont when the latter purchased the company, and then with Atlas when this concern was formed in '13. He retired to his farm near Chesapeake City, Md., in '27.

William Rintoul, 66, for 10 years director of British I.C.I.'s vast research work, died on Aug. 25th at his country place in Ardrossan, Ayshire, England. He was considered one of the world's foremost authorities on explosives.

John William Hirst, 80, one of the best known figures in the linseed oil manufacturing industry, died on Aug. 1st.

Homer Whitman, 55, Hooker Electrochemical's purchasing agent and Niagara Falls office manager, died unexpectedly on Aug. 12th.

Harry LeBreton Gray, 60, superintendent in charge of Eastman Kodak's organic research laboratories, on July 16th. He was one of the leading spirits in the formation of the A. C. S. cellulose chemistry section.

George P. Wilman, 73, chemist and dye-expert in mills of Lawrence and Providence for many years, died Aug. 10th.

Irvin F. Lehman, president of Blaw-Knox, heavy equipment manufacturers of Pittsburgh, died on Aug. 7th at Hebron, Conn., where he had gone for a rest.

Leonard Mark Shea, 45, well-known Niagara Falls resident and employed at Cyanamid's plant for the past 7 years, died on Sept. 1st from a heart attack.

The Drug, Chemical & Allied Section, N. Y. Board of Trade, is planning a fall meeting and golf outing at Skytop, Pa., on Oct. 23-24th.

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* See photograph on News Insert. Conference was led by assistant general sales manager, Arthur J. Campbell, Paul F. Haddock, southern sales manager, and August Klipstein, advertising manager.

Std. Oil Development Announces Personnel Changes

Pesola Named Research Director by Imperial Oil & Gas—Battelle Memorial Makes 4 Appointments—Cyanamid Adds Scheiber and Armstrong to Southern Territory—Clarke Now with Paul Mahler—Simpson Elected to U. S. I. Board—

An extensive realignment of responsibilities within Standard Oil Development became effective Aug. 1st. Field of development activities has broadened considerably within the past few years and the new organization set-up is expected to insure more efficient handling of the different phases of the work. Organization of the development group has been split into 3 divisions—technical, commercial, and patent and legal division.

Technical division is headed up by R. P. Russell, vice president and general manager of Standard Oil Development. It consists of a technical service department and a research and development department, the 1st under the direction of Dr. N. E. Loomis, former head of the technical service division of the Standard Oil of N. J. (Del.). Second is under E. V. Murphree who has been appointed manager of development and research, with Dr. G. M. Maverick as assistant manager.

Technical service organization will include the General Engineering Dept., Process Dept., Standard Inspection Laboratory and the newly formed Process Engineering Dept. E. W. Luster, former assistant chief engineer, becomes chief process engineer to head the new department. C. E. Paules succeeds him as assistant chief engineer.

The Research & Development Dept. includes the Esso Laboratories and the Development Department at Bayway. The latter now comes under A. D. Green, with E. J. Gohr assistant manager.

Second of the 3 main divisions of the Standard Oil Development group, the Commercial Division, will be headed up by H. W. Fisher, former assistant director of the Esso Laboratories. Mr. Fisher will report directly to F. A. Howard, president of Standard Oil Development, in connection with such technical and specialty manufacturing and sales operations as those covering Paraflow, Paratone, iso-octane and other products. Operation of the commercial division at Bayway will be under the supervision of M. D. Mann, who has been transferred to the new department from the Development Dept.

Patent and legal division of the Standard Oil Development continues under the direction of W. E. Currie, vice president.

Dr. W. J. Sweeney, who was formerly director of the Development Dept. of Standard of Louisiana at Baton Rouge, is coming to Esso Laboratories to be associate director. His place in the Louisiana organization will be taken by Dr. C. L. Brown, formerly assistant director, who is now succeeded by A. Voorhies, Jr. Mr. O. V. Tracy assumes responsibility for the manufacture of various specialties at Baton Rouge.

Research on Carbon Black

W. H. Pesola, formerly with the Vita-Var Corp., Newark, N. J., has been selected to head the new research laboratory of Imperial Oil & Gas Products at Pittsburgh. Facilities of the new department will be at the service of company customers. Mr. Pesola has had years of experience in the paint and allied fields, having been connected at one time or another with Berry Bros.; Rinshed-Mason; and Kay & Ess of Dayton.

W. H. PESOLA

His experience is available to Imperial Oil & Gas customers.

Battelle "Researchers" Named

Four appointments as research associate at Battelle Memorial Institute for '36-'37 have been announced. Alfred Clark, Ph.D., Illinois, '35, has been assigned a research project dealing with fundamental problems in chemistry; John E. Dorn, Ph.D., Minnesota, '36, in metallurgy; Robert P. Graham, M.S., Washington, '36, in ceramics; and L. G. Turnbull, Ph.D., Toronto, '36, in industrial physics.

Cyanamid's Southern Expansion

Several additions have been made to Cyanamid's Charlotte, N. C. sales force. George F. Scheiber, formerly manager of Grasselli's Charlotte office, will supervise sales in Virginia and eastern North Carolina, while G. Ray Armstrong, formerly manager of Victor Chemical's Nashville branch, will cover Mississippi, Tennessee and Louisiana.

Personnel Changes Last Month

Alexander Frieden heads Stein, Hall's Food Research Laboratory; Robert R. Ralston, former Exolon chief chemist, is now with G. E. at Pittsfield; J. R. Sanborn, former A. D. Little researcher, is now with International Paper's "labs" at Glens Falls; Horace N. Lee, fiber specialist and industrial microscopist working at Harvard, joins the Little organization; Dr. J. C. Warner, Carnegie Tech's associate professor of theoretical chemistry, is now associate professor of metallurgy.

Roland Waters, recent University of Michigan graduate, is now researching for Anderson-Prichard Oil's Industrial Naphtha Research, Chicago; Harold G. Wolfram, former director of Porcelain Enamel & Manufacturing's research, is now "Pemco's" general works manager with offices at Baltimore; Sandoz Chemical adds Dr. J. E. Meili to its research staff—his 30 years of experience will be available to Sandoz customers; Henry D. Grimes is now assistant head chemist for American Woolen at Shawsheen (Mass.) Village — Clifford Emmons succeeds Grimes as assistant chemist at the Wood Worsted Mill of the same corporation.

Kenneth B. Bolton, formerly of Certainteed Products, is now on New England sales for Titanium Pigment; Carl W. Borgmann, formerly at the University of North Carolina, is now assistant to National Tube's research director; Frank H. Carman, formerly with Goodrich's Technical Dept., is now with Armstrong Cork at Lancaster, Pa.; Peter C. Jurs (Ph.D. Stanford '36) is in Cyanamid's organic research work at the Stamford "Labs."

N. G. Sixt, former Buckeye Cotton Oil research chemist, is now Carolina Aniline & Extract's chief chemist; George Stern, formerly with Maas "Labs" on the Pacific Coast, is now assistant to the chief engineer, A. C. Fieldner, Experiment Stations Division, Bureau of Mines. Stern recently joined the "benedicts."

Joseph J. Thomas, a Penn. State instructor, is now with Rohm & Haas; A. R. Ellis, with Pittsburgh Testing Laboratory for 31 years in various capacities, is the new president.

Chris F. Bingham, well-known in the water works and sewage fields, has joined Columbia Alkali as technical service engineer.

Armour directors have promoted Harry S. Eldred, plant manager, to vice-president in charge of plants, succeeding the late Harry G. Mills.

Kenneth M. Simpson has been elected to a directorship on the U. S. I. board.

Norman L. George, I.A.C.'s South Carolina sales manager, has resigned.

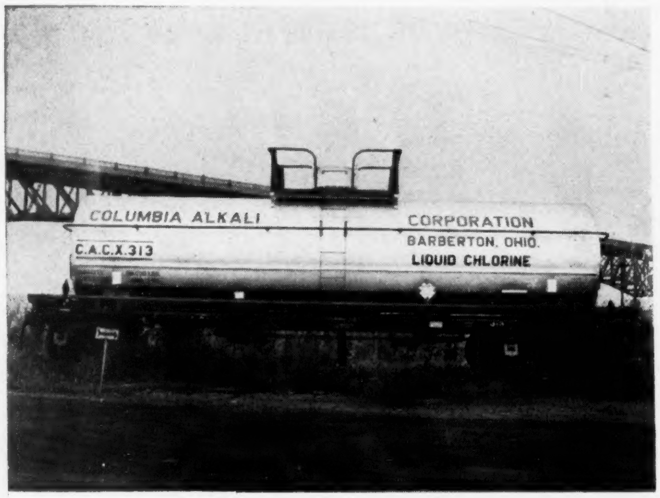
Clarke Again Active

John Clarke who recently retired from the N. Y. City consulting firm, Knight & Clarke, is now associated with Paul Mahler, consultant, with offices in the Chemists' Club Bldg.

CHEMICAL

The Photographic Record

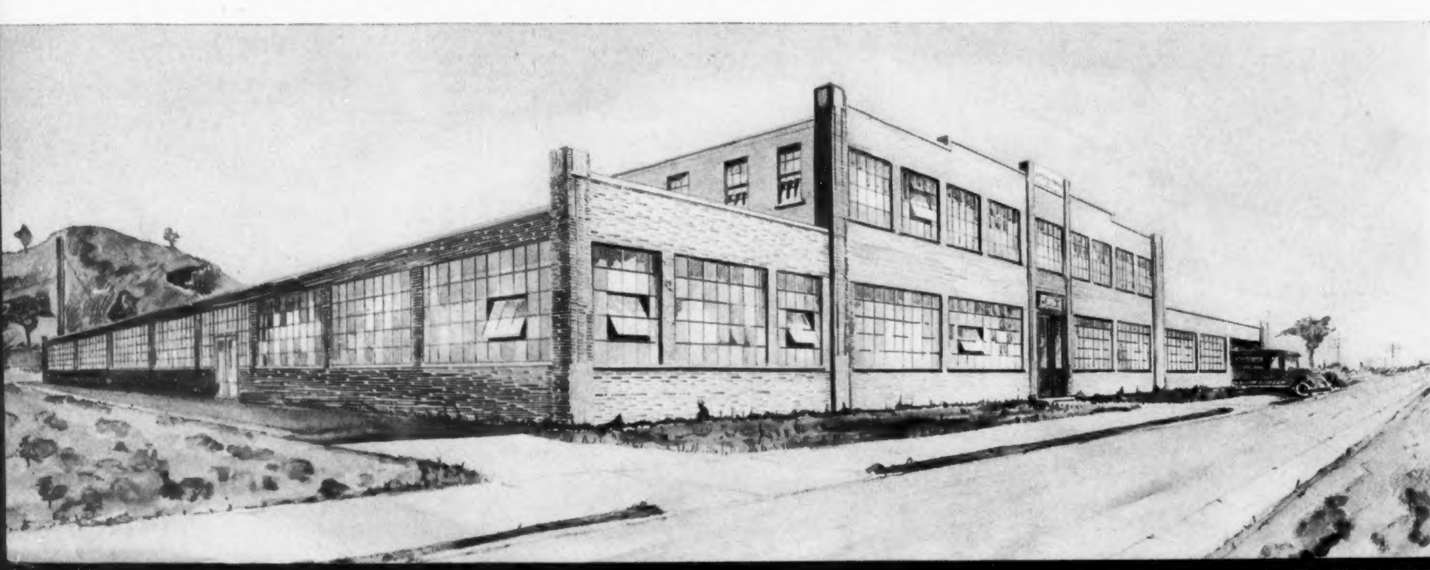
First car of chlorine shipped from the new liquid chlorine plant of Columbia Alkali at Barberton, Ohio, reaches its destination at the plant of William H. Marzahl, Kearney, N. J., manufacturers of bleach.



George Bode of duPont's R. & H. isn't the only chemical salesman with a daughter who shines in the bright lights, and Arthur K. Roberts, salesman of Warner Chemical, is the daddy of Beverly Roberts, budding star of Warner Brothers films, who recently appeared in an important role in "China Clipper."

New building of Carolina Aniline & Extract Co., Charlotte, N. C., is constructed completely of asbestos on a heavy steel frame. Walls are sheet asbestos and the roof is corrugated asbestos, fastened together with non-corrosive metal strips, by the Ambler-Olsen System. Building is the first complete unit constructed in this country by this system.

Plant of Joseph Turner & Co., for the manufacture of industrial chemicals at Pleasant View Terrace, Ridgefield, N. J., is nearing completion. Company headquarters will shortly be located at the plant, and the New York City offices will become a branch office. The Bonanno Bros. Construction Co. of North Bergen is building the new two-story plant which will be of steel and brick. It will have warehousing, distributing and manufacturing facilities with a ten-car railroad siding on the premises.



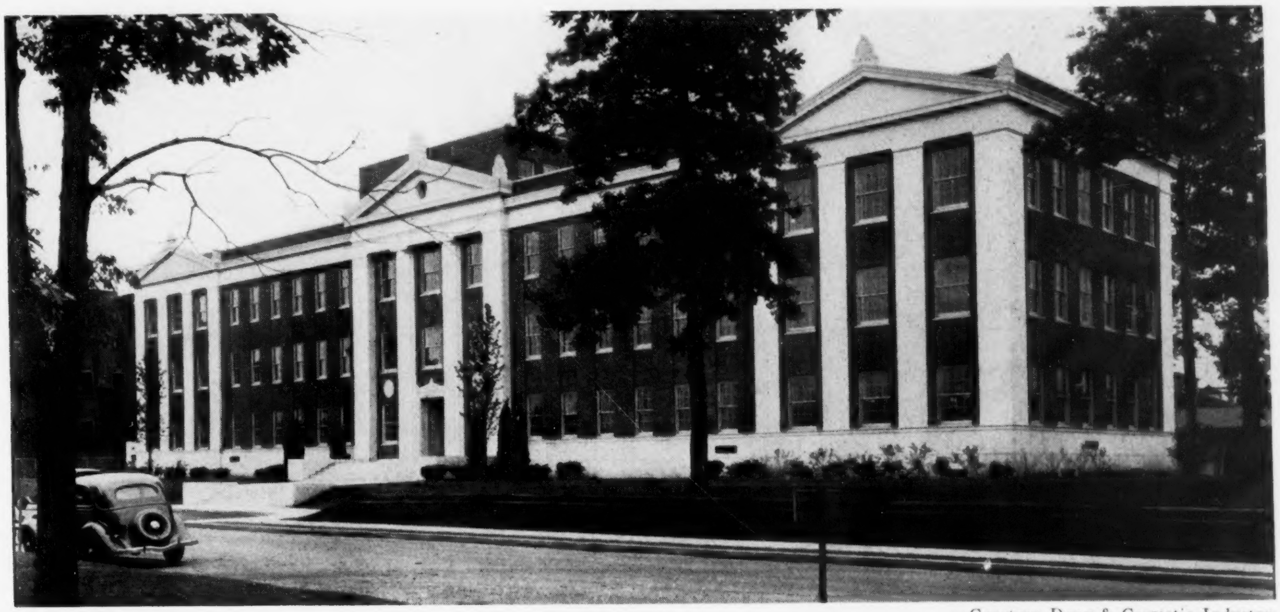
NEWS REEL

of Our Chemical Activities

Below, Merck now occupies its new administration building recently completed at Rahway, N. J. Building is located at the head of Lawrence St., at the main entrance to the company's manufacturing plant, and is of the Georgian type, structurally consisting of a steel frame with limestone and brick exterior walls and plastered interior walls and ceilings. The building has three floors and basement and penthouse fourth floor. The main section measures 212 x 47 feet, there being a 47 x 60 feet wing at the west end, and a 45 x 50 feet wing at the center.

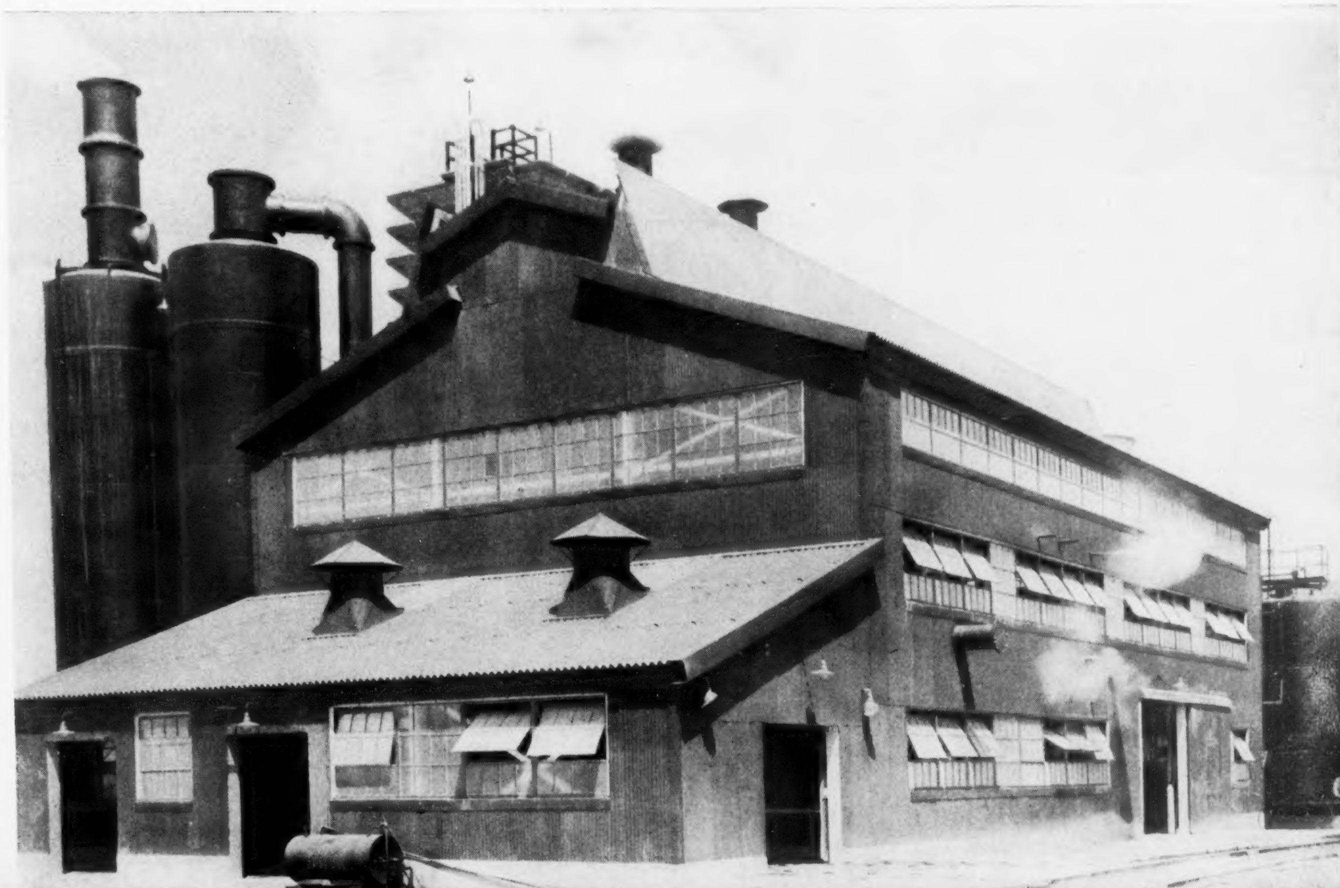
—Courtesy Niagara Falls Gazette

Mathieson Alkali employees at Niagara Falls plant hold their fifteenth annual outing at Lakeside Park, Port Dalhousie, Ont., Canada, on August 5th. Peter M. Wilson, general chairman, starts the "Embryo Barney Oldfields" off in one of the contests.



—Courtesy Drug & Cosmetic Industry

New $500,000 sulfuric acid plant of American Cyanamid & Chemical at Joliet, Illinois. Early this spring President H. L. Derby outlined before the Joliet Association of Commerce the plans for making the Joliet works an important unit in the mid-west manufacturing operations.



Bergius Defends Nazi Regime in N. Y. Interview

States Unusual Conditions Justify Existing Conditions in Germany—Esselen Represents National Research Council at Lucerne—Other Personal Notes—

Dr. Friedrich Bergius, noted German chemist who won the '32 Nobel chemistry prize for his work on the hydrogenation of coal, defended the Nazi regime in Germany in an interview in N. Y. City late last month. He was one of the speakers at the A. C. S. meeting at Pittsburgh, Sept. 7-12th.

"I feel as free in Germany as you do here, I'm sure," said Dr. Bergius.

Then, in answer to a question, he added: "No, we are not free to criticize

DR. FRIEDRICH BERGIUS

"Germans are facers of facts, not spinners of theories."

the Government in the sense that you are. But you sacrificed that particular freedom to a large extent in the war, and your young men sacrificed freedom altogether when they allowed themselves to be drafted for military service. When security and human lives are threatened, whether through actual scarcity, economic unbalance, war or revolution, the conception of freedom and its relative values undergoes a change.

"The fact of the matter is, any real freedom is the result of a feeling of security and economic opportunity, and when those conditions are absent, no matter what the cause, no Government in the world can guarantee freedom. The word loses its former meaning altogether."

Sails in Queen Mary

Gustavus J. Esselen, Boston consultant, is the National Research Council's representative at the 12th Conference of the International Union of Chemistry at Lucerne. He sailed in the *Queen Mary* Aug. 12th.

Footnotes on Headliners

Chaplin Tyler, du Pont's assistant director of publicity, discussed "Better Things for Better Living Through Chemistry," before the Rotarians of Smyrna, Del., on Aug. 21st; Carl E. Truebe, general manager of the Ernst Bischoff Co., maker of textile chemical specialties, is in Europe on a combination business and pleasure trip; High V. Alessandrini of Titanium Pigment's research was on the Olympic fencing team; H. J. French, in charge of International Nickel's alloy steel and iron development, will address the Northwest Chapter, American Society for Metals on Sept. 14th at Minneapolis; W. A. Hart, du Pont's advertising director, flew last month to the Texas Centennial; O. J. Brosig, representing A. K. Halle, Buenos Aires exporter of fertilizer materials, is in this country, and can be reached at the foreign dept. of the Guaranty Trust, N. Y. City.

David H. Litter, president of D. H. Litter, N. Y. City manufacturers' sales agent, was host on a cruise on Aug. 25th to 45 production men and technicians in the paint, varnish, and lacquer fields.

Two well-known figures in alkali circles are recovering from appendicitis operations—George Dunning of Michigan Alkali and "Jack" Schmertz, "adman" for Mathieson. Royster Guano's chief chemist, E. W. Magruder, is now fully recovered from an automobile accident in June.

Charles W. Rivise, chairman of the Patents Committee of TAPPI, delivered a talk entitled "What Constitutes Validity of a Patent," on Aug. 7th at a meeting before the international joint meeting of the technical associations of the U. S. and Canada, held aboard the *Quebec* on the St. Lawrence River.

George F. Smith, vice-president of Philipp Bros., N. Y. City manufacturers' sales agent, is in Europe. He was tendered a dinner at the Downtown A. C. on Aug. 12th.

Germany Discontinues Use of "Aski" Marks

Latest Move Fails to Relieve Difficulties Attending U. S.-German Trade—German Domestic Nitrogen Price Down 3%—Australia Bars Japanese Chemicals—Other Foreign Happenings of the Month—

Germany, on Aug. 3d, prohibited the use of discounted (Aski) marks and the practice of bartering in trade with the U. S. These orders are placed in effect for the proposed purpose of meeting the objections of the U. S. government to subsidies granted to German exporters by their government. It is said that the discontinuance of Aski marks is equivalent to increasing by about 40% exporters prices at which they can sell in this country. Use of these marks was but one method devised by Germany in an effort to overcome the relatively high valuation of German currency.

Whether the latest move of Germany will remove some of the difficulty in foreign trade between the countries is still problematical. So far there has been no move towards a recession from the position that countervailing duties will be levied on imports from Germany of goods having the benefit of a subsidy.

Chemical Notes from Abroad

Other foreign chemical news highlights: German Nitrogen Syndicate's new domestic nitrogen fertilizer price schedule for the next 4 years is down about 3%; Montecatini's sodium cyanide plant at Crotone is operating; Spanish potash production dropped from 131,674 tons in '34 to 120,566 tons in '35; Palestine Potash's 2nd Dead Sea factory is about completed; Australia has barred importation of many Japanese-produced chemicals.

An earthquake on July 13th caused the extinguishing of the boiler fires at Oficina Santa Luisa of Lautaro Nitrate, after 60 years of continuous operation; it is suggested in Chile that a centralized organization handle sulfur export sales similar to that now handling nitrate and iodine (present Chilean capacity is 3,000 tons, made from pyrites); Netherland India Government under the "Cinchona Restriction Scheme" has increased permissible export quota from 620,000 to 720,000 kilograms of quinine sulfate.

Nicaragua now permits free importation of artificial fertilizers for banana plantations; Uruguay has "upped" the tariff on sodium silicate from 9 to 52% on plea of the new single producer who is now in production; New Zealand has 2,500 acres planted to tung trees; Italy has granted permission for 2 more resin plants; Ruhr coke-oven by-products output increased 36% last year following an 18% increase in '34.

Firms operating the Eloxal Process for electrolytic oxidation of aluminum are pooling their patent rights and are also acquiring rights in foreign owned plants; Lead Industries Development Council has been formed in England to foster closer cooperation between lead and lead pigment producers.

Women "Researchers" Picked

Three outstanding women students in chemistry have been awarded graduate scholarships provided by Francis P. Garvan, president of the Chemical Foundation, it was announced recently by the Women's Service Committee of the A. C. S., of which Lois W. Woodford of Cyanamid's laboratories, Stamford, Conn., is chairman.

Steady Demand For Industrial Chemicals

Little Summer Recession Reported by Producers—Industrial Activity in Process Industries Maintained—Platinum Soars to $63—Approach of Contract Season Finds Industry Confused Over Robinson-Patman Provisions—

August consumption of industrial chemicals was extremely heavy. It is necessary to back 7 years to find an August total to compare with the tonnage which moved out into consuming channels in the past 31-day period. While automotive production declined temporarily, steel activity at 73% made a new record; textiles continued to expand; the paper, glass, and tanning industries maintained or increased operations. A seasonal letup was reported in the paint field, but the tire companies held August producton close to the July figure in an effort to build up inventory as a precautionary measure against possible labor troubles. August rubber consumption was said to be 34% ahead of August of last year with tire shipments also running ahead.

Easily the outstanding price change of the month was the sudden spurt in platinum to $63. While the chemical consumption of the metal is relatively small (it is chiefly used for catalytic purposes) it is a vital part of several important chemical processes. Rumors of a cartel are denied and much logic is back of the denial. Rather, it would seem that improved conditions in the jewelry trade and a sudden interest on the part of speculative groups are the real causes.

With the contract season so close at hand few price changes were reported. Sodium silicofluoride stocks are still scarce and a ¼c advance was placed in effect. Producers of zinc and copper cyanides lowered the spot price 1c to the contract price figures.

The industry is confused over the provisions of the Robinson-Patman Act and the effect this legislation will have on the price structure for '37. It is quite possible that there will be a delay in announcing quotations for next year. Many believe that the law will have the effect of "boosting" prices, at least those that are "below schedule." A number of sales executives are of the opinion that there will be more than the usual shifting around of tonnages as sharp buyers attempt to hold present advantages. But, generally speakng, the entire question is still too muddled to draw definite conclusions.

Seasonal consumption of chlorine continued heavy and the entrance of a new producer does not appear to have disturbed the firm price structure which has prevailed now for several years. Phosphates are still weak, but a slightly firmer situation is reported in l.c.l. caustic.

With Labor Day (traditionally marking the end of the summer season) a week later this year than last, there may be some slight delay in the inauguration of the usual fall pick-up, but September volume is expected to exceed August by about 10%. Leading chemical executives voice the opinion that tonnages over the balance of the year will set a new record, despite the uncertainties attending the election campaign. It is expected that the Spanish revolution will not lead to a general European war, but the importers of raw materials from that country are practically shut off from supplies. Stocks in this country are dwindling rapidly and this situation is being reflected in the price structure of a number of important items such as mercury, ochres, red oxide, olive oil, etc.

Important Price Changes

ADVANCED	Aug. 31	July 31
Antimony	$0.11½	$0.11⅜
Glycerine, Dynamite	.17½	.15½
Sodium silicofluoride	.07	.06¾
DECLINED		
Sodium stannate	$0.28½	$0.29

Word from Europe is that the meeting of the International Tin Committee has now been postponed until Sept. 23rd, and the outlook is now said to be much brighter for a renewal of the agreement at the end of the year.

Mercury Price Advanced To $80 a Flask

Spanish Civil War Cuts Off Imports—Glycerine Quotations Again Higher—Competition Forces Lower Camphor Prices—Iodine Situation Reviewed—

An acute shortage of mercury, direct result of civil war in Spain, brought quotations in the past month from a $73.50 level to $80 and with importers only agreeing to ship on the 1st available steamer. Domestic producers are largely limiting shipments to regular customers for there is little surplus stocks. With the metal higher, producers of calomei and corrosive sublimate instituted advances of 16 and 12c respectively.

Another sharp advance in glycerine was placed in effect last month as stocks declined still further. There is now little likelihood that the glycerine producers will actively seek anti-freeze business this winter, at least not to the extent of placing the usual advertising spreads, which will be "a break" for the alcohol producers and others in the anti-freeze field.

Competition was blamed for a ½c reduction in cream of tartar; corn syrup was sharply higher because of the poor corn crop; synthetic camphor was reduced 2c per lb., while the natural was lowered 1½c. Initiative was taken by the Japanese and the domestic producers countered with a quotation of 48¼-57c, depending upon the quantity.

Leading producers in the fine chemical, photographic chemical, and pharmaceutical fields reported August volume very satisfactory. Warm weather stimulated the sale of citric and tartaric acids. Price structure of the former appeared very firm at the 26c level established in July.

Situation in iodine is a highly interesting one. The current price for crude is 90c. It is but a few years ago that the quotation was $4.00. Domestic iodine producers (using the activated char and silver process on oil well brines in Louisiana and California) have suffered severely from the Chilean competition, and the field has narrowed down. In a review of the world iodine situation *Canadian Chemistry & Metallurgy* (July, '36, p.236) states that it is quite possible that the American producers can produce at less than $1 a lb.; but quotes an unnamed authority that the Chilean producers could under certain circumstances produce at a figure so as to market the crude in Europe or the U. S. at 25c. According to the Canadian paper, research for new applications has not aided materially in increasing consumption and it points out that one of the 2 Guggenheim plants could produce the entire output of the corporation, and that the plant of the old Lautaro Nitrate alone could easily provide the entire world consumption. According to the report, plans are supposed to be afoot now to develop the local possibilities of resublimating the crude, and, in addition, points out the strong possibility that certain iodine compounds may one day be made at the Chilean nitrate plant. The U. S. market consumes nearly 30% of the total world consumption of crude.

Important Price Changes

ADVANCED	Aug. 31	July 31
Calomel	$1.24	$1.08
Corn Syrup, 42°	3.95	3.35
43°	4.05	3.45
Corrosive sublimate	.93	.81
Glycerine, C. P.	.17½	.15½
Mercury	80.00	73.50
Red precipitate	1.54	1.44
White precipitate	1.56	1.46
DECLINED		
Camphor, slabs	$0.50	$0.55
Powder	.4940	.55
Cream of tartar	.16¼	.16¾

New officers of the Pennsylvania chapter of the A. I. C. are: Dr. Joseph W. E. Harrison, chairman; Louis D. Newitt, vice-chairman; and Dr. A. Proskowriakoff, secretary-treasurer.

Keen Competition Drives Benzol Down 2¢

Naphthalene Situation is Easier, But Shortage in Cresylic Continues—Reasons for German Embargo of Naphthalene Disclosed—U. S. Government Surveys Possibilities for Increased U. S. Production—

Benzol was reduced 2c last month when consumer demand slackened and competition among the producers became increasingly keen. A decline in shipments of the principal coal tar solvents was reported, the temporary "let-down" in the automotive centers causing lacquer and tire manufacturers to curtail somewhat manufacturing operations. But unlike benzol, the price structure of solvent naphtha, toluol and xylol remained firm. Spot stocks of these products have been scarce for months and no surpluses exist to encourage price reductions.

With the easing of the tight situation in crude naphthalene cresylic acid has taken undisputed possession of the spotlight. Supplies, particularly of the better grades, are difficult to obtain and the outlook appears to be one of continued firm and possibly rising prices for sometime to come. One definite effect of the price advances was an increase in the quotations last month on tricresyl phosphate. With the consumption of cresylic in the disinfectant and resin fields increasing steadily and with the foreign sources of supply asking much higher prices the demands on the domestic producers will likely become much greater in the next 12-month period. Fortunately the outlook for steel (and hence coking operations) is bright and domestic cresylic production should show some increase.

Reason for Germany's action in placing restrictions on exports of naphthalene has now been made clear by the report from the American Consul at Frankfort of the development of a carbon black process which is based on that item. The German government readily agreed to the request that exports be stopped so that an adequate supply of raw material for the new process would be assured. It is said that costs of manufacture are much higher than the price of American carbon black, but with the country bending every effort towards self-sufficiency in all raw materials, and with the muddled state of foreign exchange, and tariff barriers increasing, this fact is overlooked.

The Federal Government has made a survey of the domestic naphthalene situation. It is disclosed that domestic producers are planning to increase their output of crude in '37. Extent of the "stepping up" hinges on the availability of imports in the next year and the maintenance of prices within the price range of $2.50 and $3. Potential supply from by-product coke oven operation in this country is believed to be around 117,000,000 lbs., an amount more than sufficient for all domestic needs. But domestic producers have hesitated to produce anything like this amount for fear of heavy foreign competition, and also fear of inability to market increased amounts of the heavy products of tar refining, such as pitch and creosote. Better markets for these products are now a favorable factor for increased naphthalene production.

Important Price Changes

ADVANCED

	Aug. 31	July 31
None.		

DECLINED

	Aug. 31	July 31
Benzol	$0.16	$0.18
Naphthalene, crude	2.75	3.25

Charles Hardy, president of Charles Hardy, Inc., N. Y. City importers of naphthalene, returning from a 2-months' trip to Europe reports that in his opinion there is no likelihood of obtaining naphthalene from either Germany or Czechoslovakia and that the total tonnage available for export is but a few hundred tons.

Producers of intermediates report a pick-up in a number of items including anilin. Shipments of phthalic anhydride were in good volume. Steady improvement in textiles is now reflected in increases in dye production.

After 3 months of continuous gain, July coke production showed a decrease when compared with the preceding month. Daily rate of output from byproduct and beehive plants, amounting to 124,189 tons, was 2.0% below the June rate of 126,733 tons, but was 46.9% greater than the rate prevailing in July a year ago. Production of byproduct coke for the 31 days of July was 3,717,848 tons, an average per day of 119,931 tons. Compared with the June rate of 123,164 tons, there was a decrease of 2.6%, bulk of the decrease occurring at furnace plants. One plant, idle during June, resumed operations.

Output of beehive coke increased sharply, from 92,800 tons in June to 110,700 tons in July, a gain of 19.3%. All of the increased activity occurred in Pennsylvania. Stocks of byproduct coke were 6.7% higher at the end of July than at the beginning of the month. Furnace plants increased their stock piles by 8.9%, while at merchant plants reserves exceeded those of June by 5.5%.

Imports of coaltar dyes for consumption totaled 1,502,193 lbs. in the 1st 6 months of this year. This total compares with 1,810,935 imported in the corresponding period in '35. Foreign invoice value of this year's imports was $2,156,483, against $2,630,067 for the imports in the '35 period.

Forms Coal Tar Division

To handle increasing business in coal tar products Alex. C. Fergusson Co., Philadelphia, announce the formation of a Coal Tar Products Division. Morris C. Swope has been placed in charge of this department with the title of manager. Mr. Swope was a former officer and plant manager of the Coopers Creek Chemical Co. and has had 14 years' experience in the manufacturing and selling field.

This Division will deal in a complete line including: coal tar, water gas tar, drip oil, shingle stain oils, solvents, tar acids, pitch, creosote oil, cresol, phenol, cresylic acid, pipe coatings, special tar oil fractions, naphthalene and disinfectants.

These products will tie in closely with the specialty products now manufactured by the Fergusson Laboratories Division, which is the chemical specialty branch of the Company.

Complete Industrial Alcohol Schedule Released

Differential for Grain Alcohol Widened to 40c—Acetone Again Reduced 1c—Petroleum Thinner Prices Revised in Albany and Syracuse—

Sharp rise in the price of corn forced alcohol producers last month to widen the differential between grain-made and molasses-made from 25c to 40c per gal. Producers at the same time announced the full schedule of industrial alcohol prices. S.D. No. 1 is now 23c in tanks and 29c in drums in carlots; special solvent is 24c in tanks and 30c in drums in carlots. Pure, tax paid is $4.07 in tanks and $4.13 in drums in carloads, and there is a 1c differential for barrels. Lower level for the new completely denatured formulas (reported in July) is said by producers to be attracting considerable business for this time of the season. With glycerine quotations rising sharply, the alcohol producers view the anti-freeze market more optimistically this year.

Important Price Changes

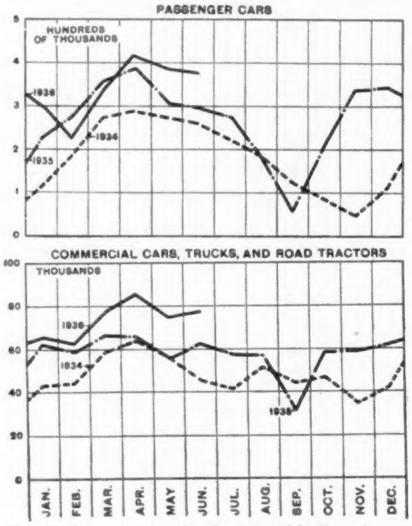
ADVANCED

	Aug. 31	July 31
None.		

DECLINED

	Aug. 31	July 31
Acetone, tks.	$0.07	$0.08
Drums	.08	.09
Alcohol:		
Special Solvent, tks.	.24	.27
SD1, tks.	.23	.28

Keen competition still prevails in the acetone market and another 1c reduction



Trend in auto production graphically shown.

was effected early last month. The 2c reduction in benzol is reported on in greater detail in the coal tar chemicals section. Markets for petroleum solvents presented a very firm front in the past 30 days, only changes being a minor one on the tankwagon quotation on petroleum thinners in Syracuse and a revision of the drum price on the same item in Albany.

There was a noticeable decline in the demand for solvents from the lacquer trade last month, but shipments into the Akron rubber center were in good volume, despite labor disturbances in at least one of the large tire plants. Tire manufacturers are pushing production heavily both as a precautionary measure against possible future labor trouble of a major character and also because of the fact that at the present rate of demand there is only 1.4 month's supply of tires in the hands of manufacturers.

Seeks Simplification

It was disclosed in Washington on Aug. 20th that the Treasury Dept. is making a special study of specially denatured formulas and their uses in an effort to reduce the number of formulas.

Textile Industry Expands Operations

Cotton Activity at Year's High Point—Fall Rayon Shortage Forecast—Tanning Operations Likely to Decline from Present High Level—More Firms to Leave Paterson Area—

The general industrial picture is much brighter as a result of the current status of textile production. Cotton spinning activity for July was 119.8% of theoretical capacity, against 111.0 for June and 73.5 during July last year and an estimated 125.0% for August. Unfilled orders on the books will sustain operations throughout the next 2 or 3 months, and many buyers have not as yet covered on fall requirements.

Important Price Changes

ADVANCED	Aug. 31	July 31
Corn sugar, tanners	$4.03	$3.43
Dextrin, corn	4.85	3.80
British gum	5.25	4.05
White	4.80	3.75
Starch, pearl	4.04	3.34
Powd.	4.15	3.44
Wattle bark	29.00	26.50
DECLINED		
Divi Divi	$32.00	$35.00
Valonia beards	46.00	64.50

Although July shipments of non-acetate rayon yarn set a new high and reduced surplus stocks to the lowest level in 6 years, August shipments "topped" July by about 5.7%, according to unofficial trade estimates. Some rayon producers are said to be adopting allotment policies and production is booked up tight through Nov. 1st. The *Rayon Organon* suggests the strong possibility of a rayon shortage this fall. With the exception of the unusual '33 period, the industry has never approached its large fall selling season with stocks as small as they are at the present time.

Considerable expansion of rayon production facilities are expected and one definite announcement is already at hand. Industrial Rayon is actively proceeding with plans for a new plant with an annual capacity of 10,000,000 lbs. of yarn to be produced by a new continuous spinning process, which, it is claimed, will produce a superior quality at lower cost. However, the development of new yarns combining various natural fibers and other combinations of natural and synthetic fibers induce caution on the part of rayon producers for these yarns promise to capture a part of the market for filament yarn.

Even the "weak sister" of the textile group, silk, shows signs of recovery. July deliveries totaled 36,658 bales, a good increase over the low June figure of 31,437 bales and preliminary estimates for August place consumption slightly ahead of July. Encouraging too, were the price advances, despite the disappointing consumption of raw silk over the past few months. Wool consumption declined somewhat in July, according to Bureau of the Census figures, and it is thought that a slight, further decline was carried through August.

Shoe production may exceed the levels of the corresponding '35 period during the coming months, in view of the continued sharp increase in retail shoe sales which to date are ahead of '35 by about 10% and which has largely absorbed the heavy surplus stocks existing last January. Tanners as a result are stepping up operations in some cases.*

Periodically the question of the general relocation of the Paterson-Passaic textile processing and dyeing plants comes to the fore. Such action would naturally have a profound effect on chemical manufacturers supplying this area. Within the past few weeks further labor trouble and an increase in water rates has added further incentive to the dyeing concerns to relocate and at least 2 important firms have signified their intention to do so within the near future.

With the smallest corn crop since 1881 forecasted, it is small wonder that dextrin, starch, etc., prices soared last month, although last minute rains in certain sections brought about a slight reduction late in the month. Some strengthening in the price structure for textile and tanning oils was reported, the result of the higher costs for basic materials employed in their manufacture. The dye price structure continues firm with the lighter shades in greater demand.

While the volume of business in the textile and tanning chemical specialties, tanstuffs and dyes was quite satisfactory last month, a large percentage of it was still of the spot variety, indicating that buyers are still adhering largely to a "hand-to-mouth" purchasing policy for the present.

Technical Rayon Meeting

A National Textile Conference in Washington next May is being planned under the co-sponsorship of the Textile Division of the A. S. M. E., U. S. Institute for Textile Research, Committee D13 of the A. S. T. M., and the American Association of Textile Chemists & Colorists. A two-day session is planned for next May for the discussion of technical developments in the manufacture and processing of rayon and acetate yarns and fabrics.

Orem Regains Golf Supremacy

The Chemical Salesmen of the American Chemical Industry held their 3rd golf tournament of the current season at Gedney Farms Golf Club, Westchester County, N. Y., on Aug. 11th, with 40 in attendance. The winners were:

Class A: E. A. Orem, du Pont; F. H. Neuberg, Warner; C. E. Kelly, Haggerty Bros. Class B: R. A. Clark, J. T. Baker, N. H. Fyffe, Oldbury Electrochemical; and C. O. Lind, Dow; Kickers' handicap, F. J. Lueders, Geo. Lueders & Co.; Robert Quinn, Mathieson Alkali; and W. D. Barry, Mallinckrodt.

Final tournament of the season will be held Sept. 15th at Pomonok Country Club, Flushing, L. I.

* July shoe production increased 20.2% over June and an 8% increase over July '35. Reports from Peabody indicate some tanners are over the peak of shipments to shoe producers. A decline in tanning operations is expected shortly as shoe manufacturers slow down production towards the year-end.

Slight Decline in Call for Raw Paint Materials

Surprise Increase of ¼c Announced in Zinc Oxide—Casein Again Advanced—Warfare in Spain Cuts Off Supplies of Red Oxide and Ochres—Red Vermillion Higher—Naval Stores Crop Cut 11½%—

Some seasonal "summer dullness" was noted in the markets for raw paint materials in the past month, although the letdown was certainly not as pronounced as it has been for the past 6 or 7 years, indicating that the paint, lacquer, enamel and varnish manufacturers are anticipating an active fall season. Lacquer production slumped temporarily as the leading automotive producers prepared for '37 models. Even so preliminary estimates place August production around 300,000 to 325,000 units. Dealer stocks will be almost completely cleaned out before the '37 models are ready, so that barring unforeseen engineering difficulties, the assembly lines will be extremely active by the last half of September.

July construction work started in the 37 states east of the Rocky Mountains was larger in volume than was reported for any other month since June '31, according to F. W. Dodge Corp. July total, which incidentally was larger than for any other July since 1930, amounted to $294,833,800 and compares with $233,054,600 for June and with only $159,257,500 for July, '35. Construction activity in the N. Y. City area in July "topped" the corresponding figure for the same month a year ago by 68.9% and the 7 months' total is ahead by 75.6%.

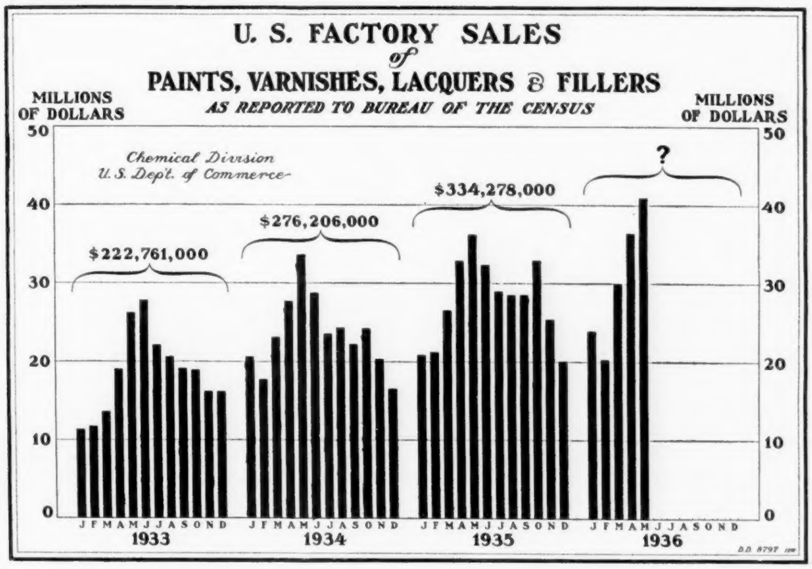
Important Price Changes

ADVANCED

	Aug. 31	July 31
Casein, std.	$0.17½	$0.16½
80-100	.18	.17
Tricresyl phosphate	.23	.19
Zinc oxide most grades ¼c.		
Vermillion, red	1.59	1.52

DECLINED

Nitrocellulose	1c reduction



Lacquer sales in the 1st half of the year totaled 21,630,735 gals. against 17,258,104 in the 1st half of last year, according to the Bureau of Census report, which includes clear and pigmented lacquers, lacquer bases and dopes, and thinners.

A surprise move was the announcement on Sept. 2nd of a ¼c advance in most grades of zinc oxide, effective Oct. 1st. Fifty per cent. leaded is up ⅜c and pharmaceutical grade remains at 8c to 8¼c. This marks the 1st change since the sweeping ¾c reduction made by American producers in October of last year. French oxides will also advance ¼c on Oct. 1st. For months there has been talk in the trade of an advance to offset the relatively low prices reached in the keen competitive situation of last fall, but until now the producers did not feel that conditions warranted an advance. Producers are thought to be allowing their customers to take material for the balance of the year at the old prices, providing the tonnage is paid for in full by Oct. 1st.

Casein quotations last month continued the steady advance of the past few months and again talk is heard in the trade of 25c casein by early winter. Buyers, now fairly well convinced that the rise is "no flash in the pan," are covering for long periods. A new ester gum schedule went into effect on Sept. 1st, direct result of advancing prices for glycerine and rosin. New schedule starts at 7¾c for carlots. During the month stearic acid quotations regained the 1c decline of July and now there is little likelihood of a change in stearates for the final quarter.

While importers have so far been able to take care of the normal needs of their customers for Spanish red oxide and certain of the imported ochres from current stocks, these are rapidly being depleted and unless hostlities soon cease there is every reason to believe that a real scarcity of stocks and higher prices are inevitable.

Aside from the rise in casein and a 2c advance in tricresyl phosphate (result of higher cresylic prices) most of the changes were in the varnish gums. Following changes were noted in the past month: Gum Copal Congo, No. 12, a ¼c reduction; No. 13 off ⅜c; No. 14 off 1½c. Other reductions are summarized as follows:

Advanced

Gum Copal Manila Loba CNE, DK, ⅜c per lb.

Declined

Gum Copal, E. I. Rasak nubs, chips. ⅜c per lb.
Bold, black, scraped, ⅜c
Unscraped, nubs and chips, ¼c
Manila, Loba A, 1¼c
B, ⅞c
C, ½c
MA, ⅛c
MB, ⅜c
Gum Copal Congo, No. 19, ¼c

Naval Stores Prices Rise

Naval stores soared last month, particularly rosin quotations. Volume of business actually placed was fair, but many buyers were reported as being out of the market for the present. Official figures of the U. S. Forest Service show a likelihood of a reduction in the output of the current season of about 11½%. On Aug. 1st there were approximately 125,000,000 cups in place and about 14,280,000 of these were removed during the month. Report was considered by some as a bullish factor, while, on the other hand, certain factors had expected greater curtailment. It is reported that there are 921 producers participating in the program and in the original plans a curtailment of 25% was proposed.

In the opinion of some the recent sharp price rise has largely discounted the curtailment program and that any further improvement in prices would largely depend upon the trend in domestic and foreign demand. As the month closed a fair amount of inquiries from foreign sources were about in the primary centers but very little actual business was placed.

National Carbon Victor

U. S. Circuit Court of Appeals for the 2nd District on Aug. 10th affirmed the decree of the U. S. District Court for the District of Connecticut, issued May 13, '35, which held that certain claims of the Chaney U. S. Patents No. 1,497,543 and 1,497,544, covering activated, vapor-adsorbent carbon were valid and infringed.

Suit was brought by National Carbon, unit of Union Carbide and Carbon, against Richards & Co., and The Zapon Co., of Stamford, Conn.*

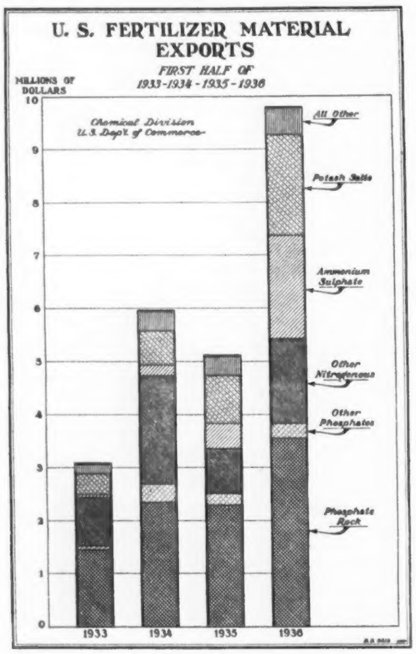
* See C. I., June '35, p569, for further details.

Fertilizer Co. Balance Sheets Reflect Price Cuts

Mixers Will Pay Higher for Nitrogen in Next Season—Nitrate, Sulfate, Nitrogen Solution, and Cyanamid Schedules Released —July Tag Sales Above Last Year—TVA Reported Securing Tennessee Land Leases—

If the statement that severe price cutting in the mixed fertilizer field has taken place requires substantiation it is easily obtained from the financial statements issued last month by both A.A.C. and V.C., the former showing a decline from $6.75 a share to $4.71, while the latter barely broke even. Difference in the showing of the 2 companies was due partly to the fact that A.A.C. has large Northern tonnage where prices were better stabilized, while V.C.'s big outlet is in the South where price cutting was severe.

For the 1st time the synthetic producer of sodium nitrate took the initiative in a price increase. Heretofore the lead has always been taken by the Chilean interests. According to the Barrett announcement, Arcadian nitrate of soda for October-June delivery will be $1 per ton higher, or $25.50 in bulk. The steady advances in the organic ammoniates continued last month and quotations have now reached the point where the fertilizer mixer has only an academic interest in them. On the average, they are 70c a unit higher than they were in the corresponding period last year. According to the announced sulfate of ammonia schedule, an advance of 50c became effective on Sept. 1st for the September-November position and on Dec. 1st an additional 50c will be tacked on for the December-June position. On Aug. 1st the contract price on nitrogen solution was advanced from 96c a unit to $1.04, and the 96c quotation on urea-ammonia liquor was withdrawn. So far no new schedule has been released. The cyanamid quotations, as announced, are $1.07½ per unit of ammonia at Gulf ports or delivered at interior points, and $1.03 at Atlantic ports. From the foregoing it is not difficult to deduce that the fertilizer mixer will pay more for his nitrogen content next season.



Important Price Changes

ADVANCED

	Aug. 31	July 31
Ammonium sulfate	$25.50	$25.00
Blood, dried, N. Y.	4.00	3.10
Chicago	4.00	3.35
Imported	3.45	3.00
Bone, 4½ and 50, Chgo.	23.00	22.00
Imported	28.00	27.50
Bone Meal, 3 and 50:		
Imported	24.75	23.00
Domestic	18.00	16.00
Calcium phosphate, debasic, imp.	.66	.62
Fish scrap, ungrd.	3.25	2.85
Hoof meal, Chgo.	3.00	2.75
Nitrogenous material:		
Imp.	2.75	2.35
Eastern	2.75	2.40
Nitrogen solution	1.04	.96
Sodium nitrate (Oct. 1)	25.50	24.50
Tankage, imported	3.65	3.00
Grd., N. Y.	4.00	3.25
Fert., Chgo.	3.50	2.90

The mixer who places his potash business this month can still obtain a 5% discount; if he places it between Oct. 1st and Nov. 30th he will receive a 2% discount. Most of the large tonnage is said to have been already placed however, and current business is slow. An interesting sidelight on the potash picture is the announcement of the American Potash Institute that potash deliveries in the 2nd quarter totaled 48,789 tons of actual K_2O and in the 1st half, 119,206 tons. Figures in each case include salts of domestic and foreign origin.

July fertilizer tag sales in the South reached 44,300 tons as against 17,267 in '35 and 25,965 in '34. For both the south and midwest the July total was 58,833, as against 24,333 in '35 and 28,383 in '34. July sales, however, form a very insignificant part of the year's total. For the fiscal year ending June 30th there was a 9% rise in superphosphate production, a 21% increase in shipments to consumers, and a 15% decline in stocks. At the close of August there had been no announcement of superphosphate prices for the southeast, and further delay was reported as likely from factors in the Atlanta district. An interesting angle to the phosphate situation is the reported activity of the TVA in purchasing large Tennessee land tracts. There is said to be quite a bit of speculative activity and no longer are phosphate deposits on a farm a liability rather than an asset. In addition to the TVA, certain of the private companies in the phosphate field have been reported as heavy purchasers of phosphate parcels in that area.*

* July superphosphate production, 200,326 tons was the largest for the month in several years but shipments were unusually small.

New Oils and Fats Import Tax In Effect

Marked Changes in Trade Use Expected as a Result of New Levy—Chinawood Quotations Again Lower—Linseed Production at 6-Year Peak—

Oils and fats markets were featured last month by further declines in chinawood oil quotations, rather sharp increases in animal oils and fats, and higher quotations for copra, coconut, palm, corn, and olive oils and olive oil foots. Fish oils were generally lower.

One encouraging sign of improved industrial conditions was the report of the Bureau of Agricultural Economics which reported the largest linseed oil production in 6 years, a total of 505,531,000 lbs., as against 404,060,000 in '34-'35.

On Aug. 21st the new taxes applying to imports of oil bearing seeds and seed oils went into effect. Marked changes in the trade use of several important fats and oils as a result of the new excise taxes are to be expected, says the Bureau of Agricultural Economics, which has just made public a study of the probable effect of the excise taxes of 1936 on fats and oils. New items subject to an excise tax on imports are tallow and inedible animal fats and greases, 3c per lb.; hemp and perilla oils, rape and kapok oil 4½c per lb.; hemp, perilla, rape, kapok and sesame seeds 2c per lb.

Fatty acids and salts of taxable oils are taxed at the same rate as the fat or oil from which derived. Fatty acids of linseed oil are taxed 4½c per lb. The excise taxes now apply to all the taxable oils, fatty acids and salts, whether or not refined or otherwise processed.

Persistent decline in china wood oil prices during the past few weeks should end shortly, although trade opinion is divided as to the future price action of the commodity. Stocks in China are abnormally low, and good buying interest there could advance the market very sharply. Domestic stocks are 3 times last year's usually low levels, however, and are about 50% larger than those held here 2 years ago. Offerings of resale oil have been a depressing factor in the china wood oil market here recently but at the present levels there is little profit for the reseller.

Drought has created havoc with the flaxseed crop in the Northwest and reports from the Argentine indicate lower acreage so that the outlook now appears bullish for linseed prices. Cottonseed oil prices were firm throughout most of the past month.

Stocks Again Rise But Pace is Slower

Mixed Trend in Chemical Group—Several Dividend Increases and Extras Announced—Lautaro Plans Resumption of Interest Payments—Westvaco's New Offering Priced at $31 a Share—Second Quarter Earnings Make Favorable Reading—

Market gains in August were slight, but the small margin of increase managed to preserve the record which has been favorable almost always in that month. A certain measure of Fall business discounting is accomplished usually in the weeks prior to Labor Day, while after that date there is often a lull for a week or so, possibly while the financial district settles back to reappraise prospects.

Steels, electrical and railroad equipments were the favorite issues last month, while motors and oils were lower. Farm equipment shares also lost ground.

Movement in the chemical group was mixed, as a glance at the accompanying statistics indicate. Several important gains were made in certain issues, notably Allied, and important losses occurred in du Pont (8 points) and in U. S. I. (2¾ points). Action of the latter company in passing the dividend had a bearish effect on the price trend but such action was not entirely unexpected and therefore, was discounted largely in advance.

Chemical stocks, even at current levels, are reported as still being attractive to the general public. The Street believes that as a result of the high rate of activtiy by most of the large chemical producers, that earnings this year will make new high records, and further, that a string of extra dividends will possibly be declared at the December meetings as a natural corollary of the excess profits bill.*

The Month's Highlights

Highlights of the chemical financial news last month included the announcement of a plan for the resumption of interest and sinking fund payments on its debt by Lautaro after a 4-year suspension; fixing of a price of $31 a share by Westvaco for the public offering of 192,000 shares of 5% $30 par convertible preferred; du Pont's extra of 70c; Carbide's increase in dividend from 60c to 70c; talk of possible stock dividend by Allied; Cyanamid's net for the 1st 6 months of 68c a share (A and B) as against 59c in the same period last year; Monsanto's net of $1,070,731 for the June quarter, as against $1,071,691 in the preceding quarter and but $964,281 in the June quarter of last year; a report by United Chemicals showing a net loss of $11,667 for the 1st 6 months of '36, comparing with a net loss of $27,107 in the 1st 6 months of '35; and the making of a new high by Penn Salt, one of the Curb's blue chips, following the publication of a report showing a net profit of over $8.50 a share for the year ended June 30th.†

* Value of chemical group (N. Y. Stock Exchange) was $6,039,155,626 on Aug. 1st, and the average price, $74.12; the general list gained $465,157,689 during the month. On Sept. 1st there were 1,198 issues listed with a market value of $54,502,083,004, comparing with 1,199 issues with a value of $54,066,925,315 on Aug. 1st.

† Other news making favorable reading; a 25c extra by Monsanto; a 25c extra by Heyden; a 10c extra by Westvaco; a 12½c extra by National Lead; and a raise from 60c to 75c by United Carbon on its quarterly dividend rate.

Earnings Statements

Hercules Powder for 6 months ended June 30th, shows net profit of $1,772,044 after depreciation, federal income taxes, etc., equivalent after dividend requirements on 7% preferred stock, to $2.51 a share on 583,865 no-par shares of common. No mention is made of any provision for federal surtax on undistributed profits. This compares with $1,543,680 or $2.01 a share, on 583,574 common shares in 1st half of '35.

For quarter ended June 30th, last indicated net profit, based on a comparison of company's reports for 1st quarter of fiscal year and the 6 months period, was $966,943 after charges and federal income taxes, equal to $1.39 a share on 583,865 common shares comparing with $805,101 or $1.12 a share on 583,851 common shares in preceding quarter and $746,620 or 96c a share on 583,574 common shares in June quarter of previous year.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Lab. (new), ext.	15c	Sept. 15	Sept. 28
Abbott Lab. (new)	30c	Sept. 15	Sept. 28
Archer-Daniels-Midland	50c	Aug. 21	Sept. 1
Atlas Powder, ext.	25c	Aug. 31	Sept. 10
Atlas Powder	50c	Aug. 31	Sept. 10
California Ink	50c	Sept. 21	Oct. 1
California Ink, ext.	12½c	Sept. 21	Oct. 1
Canadian Indust., Cl. A	$1.25	Sept. 30	Oct. 31
Canadian Indust., Cl. B	$1.25	Sept. 30	Oct. 31
Canadian Indust., pf.	$1.75	Sept. 30	Oct. 15
Carman & Co., Cl. A, acc.	50c	Aug. 15	Sept. 1
Climax Molybdenum	20c	Sept. 12	Sept. 30
Colgate-Palmolive-Peet	12½c	Aug. 6	Sept. 1
Colgate-Palmolive-Peet, pf.	$1.50	Sept. 5	Oct. 1
Columbian Carbon	$1.00	Aug. 17	Sept. 1
Comp. Ind. Gases	50c	Aug. 31	Sept. 15
du Pont, ext.	70c	Aug. 26	Sept. 15
du Pont	90c	Aug. 26	Sept. 15
Eagle Picher Lead	10c	Sept. 15	Oct. 1
Eagle Picher Lead, 6%	$1.50	Sept. 15	Oct. 1
Eastman Kodak, pf.	$1.50	Sept. 5	Oct. 2
Eastman Kodak, ext.	25c	Sept. 5	Oct. 1
Eastman Kodak	$1.25	Sept. 5	Oct. 1
Fansteel Met., pf.	$1.25	Sept. 15	Sept. 30
Fansteel Met., pf.	$1.25	Dec. 15	Dec. 31
Freeport Texas Co.	25c	Aug. 14	Sept. 1
Freeport Texas Co., pf.	$1.50	Oct. 15	Nov. 2
Hercules Powder	$1.25	Sept. 14	Sept. 25
Heyden Chemical, ext.	25c	Aug. 20	Sept. 1
Heyden Chemical	25c	Aug. 20	Sept. 1
Int'l Nickel	35c	Aug. 31	Sept. 30
Int'l Salt	37½c	Sept. 15	Oct. 1
Koppers Gas & Coke, 6%, pf.	$1.50	Sept. 12	Oct. 1
Lindsay Lt. & Chem., pf.	17½c	Sept. 4	Sept. 14
Mathieson Alkali	37½c	Sept. 8	Sept. 30
Mathieson Alkali, pf.	$1.75	Sept. 8	Sept. 30
Monsanto Chemical, ext.	25c	Aug. 25	Sept. 15
Monsanto Chemical	25c	Aug. 25	Sept. 15
Nat'l Lead ext.	12½c	Sept. 11	Sept. 30
Nat'l Lead	12½c	Sept. 11	Sept. 30
Nat'l Lead, Cl. A, pf.	$1.75	Aug. 28	Sept. 15
Nat'l Lead, Cl. B, pf.	$1.50	Oct. 16	Nov. 2
Nat'l Oil Products, ext.	20c	Sept. 21	Sept. 30
Nat'l Oil Products	30c	Sept. 21	Sept. 30
Patterson-Sargent	25c	Aug. 20	Sept. 1
Penick & Ford	75c	Sept. 1	Sept. 15
Procter & Gamble, 5% pf.	$1.25	Aug. 25	Sept. 15
St. Joseph Lead	20c	Sept. 9	Sept. 21
Sherwin-Williams, pf.	$1.25	Aug. 15	Sept. 1
Spencer, Kellogg	40c	Sept. 15	Sept. 20
Texas Gulf Sulphur	50c	Sept. 1	Sept. 15
Union Carbide	70c	Sept. 4	Oct. 1
United Dyewood, pf.	$1.75	Sept. 11	Oct. 1
United Dyewood, pf.	$1.75	Dec. 11	Jan. 1 '37
U. S. I.	Omitted Aug. 27		
Westvaco Chlorine, ext.	10c	Aug. 15	Sept. 1
Westvaco Chlorine	10c	Aug. 15	Sept. 1

Atlas Powder Nets $2.12

Atlas Powder and subsidiaries report for 6 months ended June 30th, net profit of $735,755 after depreciation, federal income taxes, etc., equivalent after dividend requirements on 6% preferred, to $2.12 a share on 249,966 no-par shares of common, excluding 11,472 shares held by company. This compares with $479,782 or 93c a share on common in 1st half of '35.

Sales for 1st half of '36 amounted to $7,476,459 against $6,152,328 in 1st half of '35.

For quarter ended June 30th, last, net profit was $380,619 after charges and

Price Trend of Chemical Company Stocks

	July 31	Aug. 7	Aug. 14	Aug. 21	Aug. 28	Aug. 31	Net gain or loss last month	Price on Aug. 31, 1935	1936 High	1936 Low
Air Reduction	79¼	78⅞	75⅞	73	74⅛	73⅞	—5⅜	141½*	81¾	58
Allied Chemical	217	242	236	220	236	226	+9	161	245‡	157
Columbian Carbon	127½	130	127¼	123	...	122†	—5½	87	136½‡	94
Com. Solvents	16½	16⅜	16	15⅞	16¾	16⅞	+ ⅜	19	24⅝	14¼
du Pont	165	166	159	158¼	157⅝	157	—8	118	167¾	133
Hercules Powder	114	113½	112⅛	113¾	114½	113¾	— ¼	83½	115⅛	84
Mathieson	34	34¾	35¼	33⅝	35⅜	35¾	+1¾	29½	37⅝‡	27½
Monsanto	99¼	98¾	99	98	99½	100⅛	+ ⅞	72*	103	79
Std. of N. J.	62⅛	63	63⅜	61¼	63¾	62⅞	+ ¾	45½	70	51⅛
Texas Gulf S.	35⅞	36¼	37⅜	36⅛	38⅜	38⅜	+2½	34¾	39⅛‡	33
Union Carbide	95¼	99⅝	98⅛	93⅝	96¼	95¼	...	64⅝	100‡	71⅝
U. S. I.	37	34⅞	35½	35¼	33	34¼	—2¾	42½	59	31¼a

* Old stock; † Aug. 27th; ‡ New high in August; a New low in August.

federal income taxes, equal to $1.11 a share on common comparing with $355,136 or $1.01 a share in preceding quarter and $234,447 or 45c in June quarter of previous year.

Net profit for the 12 months ended June 30th was $1,417,142 after charges and federal income taxes, equal to $4.00 a share on common; sales for the 12 months totaled $14,411,098.

Newport Industries Reports Profit

Report of Newport Industries, and subsidiaries for quarter ended June 30th, subject to annual audit, shows net profit of $94,966 after depreciation, interest, federal income taxes, etc. No mention is made of any provision for federal surtax on undistributed profits.

This compares with net profit of $67,439 in preceding quarter and $84,708 in June quarter of previous year. Net profit for June quarter of this year, is exclusive of $23,225 provision for reduction in investment in Armstrong-Newport Co., which is charged to deficit account, while the net profit in preceding quarter is exclusive of a similar charge of $24,462 and June quarter of previous year is exclusive of similar charge of $6,071.

For the 6 months ended June 30th, last, net profit was $162,405 after charges and federal income taxes, comparing with $152,272 in 1st half of '35. Net for the 6 months is exclusive of $47,687 provision for reduction in investment in Armstrong-Newport Co., while '35 period excludes $26,675.

Net profit for the 12 months ended June 30th, last, was $305,250 after charges and federal income taxes, exclusive of $88,114 provision for reduction in investment in Armstrong-Newport Co.

Aided by Whisky Sales

Earnings of American Commercial Alcohol, mainly from its sales of whisky, in the 6 months ended June 30th, were the largest in the history of company. Net profit was $675,026 after taxes. During the half $346,000 was set aside in a reserve for estimated unrealized profits on sales subject to deferred delivery, pending payment in cash of notes representing the balance of sales price. In 1st quarter $149,000 was put into reserve and in 2nd quarter $197,000.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1936	Net income 1935	Common share earnings 1936	Common share earnings 1935	Surplus after dividends 1936	Surplus after dividends 1935
American Agricultural Chemical							
Year, June 30	$3.00	$1,005,813	$1,427,603	*h*$4.71	*h*$6.37	$344,289	$978,044
American Cyanamid							
**June 30 quarter	.60	969,988	855,375	.38	.34	*......	*......
Six months, June 30	.60	1,708,003	1,493,680	.68	.59	*......	*......
American Zinc, Lead & Smelt.							
June 30 quarter	*f*....	10,669	†73,212	*p*.14	....	......	......
Six months, June 30	*f*....	†32,636	†99,442	....	....	......	......
Twelve months, June 30	*f*....	†152,343	......	....	....	......	......
Anaconda Copper Mining							
**June 30 quarter	*w*.25	3,019,105	2,864,161	.35	.33	......	......
Six months, June 30	*w*.25	5,827,425	5,214,882	.67	.60	......	......
Atlantic Refining							
**June 30 quarter	1.00	1,154,391	384,378	.38	.14	......	......
Six months, June 30	1.00	3,137,391	255,378	1.12	.10	1,658,066	*d*1,077,572
Certain-teed Products							
June 30 quarter	*f*....	71,211	*y*296,057	*p*1.13	.48	......	......
Six months, June 30	*f*....	†205,756	*y*163,708	....	*p*2.60	......	......
Chickasha Cotton Oil							
Year, June 30	2.00	128,196	547,648	.50	2.15	*d*381,804	37,648
Colgate-Palmolive-Peet							
Six months, June 30	§.50	370,198	1,924,810	*p*1.50	.60	*d*858,497	697,192
Columbian Carbon							
**June 30 quarter	§4.00	816,294	715,034	1.52	1.33	......	......
Six months, June 30	§4.00	1,843,305	1,502,492	3.43	2.79	......	......
Continental-Diamond Fibre							
g June 30 quarter	*w*.50	184,253	31,584	.40	.07	......	......
g Six months, June 30	*w*.50	229,972	46,799	.50	.10	......	......
International Nickel Co. of Can.							
June 30 quarter	*w*.35	9,070,187	5,420,615	.59	.34	4,213,262	2,750,416
Six months, June 30	*w*.35	17,456,974	10,338,242	1.13	.64	8,472,032	4,997,842
International Printing Ink							
**June 30 quarter	1.80	342,910	280,099	*h*.88	*h*.75	......	......
Six months, June 30	1.80	585,711	489,606	*h*1.41	*h*1.23	145,009	210,041
Twelve months, June 30	1.80	1,176,862	......	2.84	....	......	......
Liquid Carbonic							
June 30 quarter	§1.60	628,491	438,975	1.79	1.25	*......	*......
‡‡Nine months, June 30	§1.60	435,055	296,307	1.24	.84	*......	*......
Twelve months, June 30	§1.60	1,072,214	685,228	3.06	1.95	*......	*......
Monsanto Chemical							
June 30 quarter	§1.00	1,035,730	923,125	*h*.93	*h*.95	......	......
Six months, June 30	§1.00	2,068,583	1,848,449	*h*1.85	*h*1.90	......	......
New Jersey Zinc							
June 30 quarter	§2.00	1,265,593	1,113,324	.64	.57	283,961	131,692
Six months, June 30	§2.00	2,339,772	2,174,213	1.19	1.11	*d*605,124	210,949
Pennsylvania Salt Mfg.							
g Twelve months, June 30	§3.00	1,285,645	891,086	8.57	5.94	......	......
Vanadium Corp.							
Six months, June 30	*f*....	41,838	†270,181	.11	....	......	......
United Chemicals, Inc.							
**June 30 quarter	*f*....	†6,005	†13,005	....	....	......	......
Six months, June 30	*f*....	†11,667	†27,107	....	....	......	......
Virginia-Carolina Chem.							
Year, June 30	*f*....	93,754	1,277,578	*x*.44	*x*4.20	......	......
Vulcan Detinning Co.							
g June 30 quarter	*w*4.00	66,497	74,062	1.23	1.45	......	......
‡‡Six months, June 30	*w*4.00	127,491	140,253	2.30	2.65	......	......
Westvaco Chlorine Prods.							
**June 30 quarter	§.40	148,071	152,775	.38	.40	*......	*......
Six months, June 30	§.40	310,770	315,008	.82	.83	*......	*......

h On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; *f* No common dividend; † Net loss; *p* On preferred stock; *w* Last dividend declared; *d* Deficit; § Plus extras; *g* Report subject to audit and year-end adjustments; ‡‡ Indicated earnings; * Not available; *x* On 6% preferred stock.

Paint Co. Profits Rise

Glidden's net profit for June was $242,842, according to Adrian D. Joyce, president. This compares with net profit of $215,234 in the like '35 month. Sales amounted to $3,965,382, compared with $3,454,093 in June, '35, and sales for 8 months to June 30th totaled $27,608,234, compared with $24,653,095 in like '35 period.

Report of Devoe & Raynolds and subsidiaries for 6 months ended May 31, '36, shows profit of $239,458 after expenses and depreciation, but still subject to taxes and year-end adjustments. This compares with profit of $201,585 for the same period of '35. Rise in profits for past year, according to company officials, is due to increase in sales, with sales for June '36 running 25% over June '35.*

St. Joseph Lead Turns Loss Into Profit

Report of St. Joseph Lead and subsidiaries for 6 months ended June 30th, shows net profit of $647,175 after depreciation, obsolescence, interest, minority interest, federal income taxes and depletion, equivalent to 33c a share on 1,955,676 shares (par $10) of capital stock. No provision was made for federal surtax on undistributed profits. This compares with net loss of $78,398 in 1st half of '35.

Details of Westvaco's New Issue

The N. Y. Stock Exchange has received notice from Westvaco Chlorine Products of the proposed issue of 250,000 shares of 5% convertible preferred stock, of the par value of $30 a share and an increase in common stock of 260,000 shares.

Westvaco now has outstanding $2,194,600 7% cumulative preferred and 284,962 shares of common and it is understood that the new preferred is for the purpose of refunding the present issue and to provide additional working capital. New funds will also be used for retiring remaining outstanding debentures.

Allied Chemical's Outlook

Indications so far this year are that Allied Chemical will do better than in any year since 1929, according to the *N. Y. Journal of Commerce*. It should report considerably more than the $9.77 a share reported for 1930. In 1935 net was $8.71 a common share, while retirement of the preferred stock early this year would of itself leave close to $1 a share additional for the common. This has led to expectations of a larger dividend later in the year, if the improvement continues.

* Rumors have it that Devoe & Raynolds may declare an extra at the next meeting.

Chemical Stocks and Bonds

1936 August Last	1936 August High	1936 August Low	1935 High	1935 Low	1934 High	1934 Low	Sales: Number of shares August 1936	Sales: Number of shares 1936	Stocks	Par $	Shares Listed	An. Rate*	Earnings $-per share-$ 1935	Earnings $-per share-$ 1934
NEW YORK STOCK EXCHANGE														
73⅞	81¾	58	57½	35	37⅝	30⅝	31,700	210,000	Air Reduction	No	2,523,864	$1.50	2.10	1.66
226	245	157	173	125	160¾	115⅛	21,800	261,700	Allied Chem. & Dye	No	2,214,099	6.00	8.71	6.83
59½	63¼	49	57¾	41½	48	25¼	7,100	82,600	Amer. Agric. Chem.	100	315,701	2.00	.....	p6.37
28⅛	32⅝	20½	35¾	22½	62½	20¾	51,600	233,300	Amer. Com. Alcohol	20	260,716	None	3.16	3.57
40¼	50	37	52	36	39⅛	26¼	6,200	58,900	Archer-Dan-Midland	No	541,546	1.50	.....	p4.21
69	73	48	48½	32¾	55½	35¼	7,000	43,600	Atlas Powder Co.	No	234,235	2.25	2.81	2.49
123	126¼	112	115	106¾	106¾	83	400	4,740	6% cum. pfd.	100	88,781	6.00	16.93	13.54
26⅝	32¼	21¾	35⅛	19½	44⅞	17⅛	109,500	673,900	Celanese Corp. Amer.	No	987,800	.50	1.99	1.25
14¼	20½	13	21	15⅛	18⅛	9⅜	71,900	472,600	Colgate-Palm.-Peet	No	1,985,812	.75	1.36	1.16
101½	106½	100	107¼	101	102½	68½	3,900	17,300	6% pfd.	100	254,500	6.00	16.79	16.14
124⅝	136½	94	101¼	67	77¼	58	9,000	97,300	Columbian Carbon	No	538,154	4.50	5.56	3.93
16⅞	24½	14¼	23⅞	16½	36¾	15¾	130,200	1,608,700	Commer. Solvents	No	2,635,371	.60	1.02	.89
69½	82½	63⅝	78⅜	60	84½	55½	54,800	331,900	Corn Products	25	2,530,000	3.00	2.62	3.16
160	168½	158	165	148¾	150½	135	700	7,000	7% cum. pfd.	100	243,739	7.00	33.97	39.65
53	58¼	42	50⅜	35½	55¼	29	2,300	42,000	Devoe & Rayn. A	No	95,000	2.00	2.89	2.36
157	167¾	133	146½	86⅝	103⅞	80	50,700	347,000	DuPont de Nemours	20	10,871,997	5.00	5.04	3.63
129¼	133⅛	129	132	126⅞	128½	115	3,100	23,800	6% cum. deb.	100	1,092,699	6.00	56.94	42.73
177	185	156	172¼	110⅝	116½	79	10,100	87,800	Eastman Kodak	No	2,250,921	6.00	6.90	6.28
161¾	166	152	164	141	147	120	630	3,260	6% cum. pfd.	100	61,657	6.00	258.09	235.22
26½	35⅜	23½	30⅝	17¼	50⅜	21½	27,800	282,200	Freeport Texas	10	784,664	1.00	1.78	1.76
120	135	118½	125	112½	160⅛	113½	120	1,490	6% conv. pfd.	100	25,000	6.00	121.30	120.08
42	55¼	39¾	49½	23⅜	28⅜	15⅝	25,100	266,100	Glidden Co.	No	603,304	2.00	.....	x 2.91
54⅛	55	52½	111	104⅞	107½	83	4,200	22,460	4½% cum. pfd.	50	200,000	2.25	.....	.....
103½	133	102	119½	85	96⅞	74	1,600	14,000	Hazel Atlas	25	434,409	5.00	7.58	5.21
113¼	115⅛	84	90	71	81⅝	59	3,800	39,800	Hercules Powder	No	582,679	5.00	4.23	3.94
127½	135	126	131	122	125¾	111	270	2,750	7% cum. pfd.	100	105,765	7.00	36.30	28.79
32	34⅝	25⅝	36⅜	23½	32	19⅜	45,300	317,800	Industrial Rayon	No	600,000	1.68	1.00	2.23
3¼	5⅞	2⅞	5	2⅝	6⅛	2	5,300	283,900	Intern. Agricul.	No	436,049	None	.....	p—.99
27	41	22¾	42¾	26	37¼	15	2,200	55,400	7% cum. pr. pfd.	100	100,000	None	.....	p2.69
53⅞	54½	43¼	47¼	22¼	29¼	21	223,300	1,584,800	Intern. Nickel	No	14,584,025	1.25	1.65	1.14
27½	29⅜	23	36¼	25	32	21	2,300	28,300	Intern. Salt	No	240,000	1.50	1.32	2.02
32	36¾	29¾	36¼	31	33⅛	15¾	1,700	20,300	Kellogg (Spencer)	No	500,000	1.60	.....	v2.22
68¼	70½	47¼	49¼	21½	43⅞	22½	69,400	491,800	Libbey Owens Ford	No	2,559,042	2.00	3.26	1.25
41½	44¼	32½	37¼	24½	35⅜	16⅛	25,300	138,700	Liquid Carbonic	No	342,406	1.60	v3.06	1.96
35¾	37½	27½	33⅞	23¼	40¾	23½	51,700	246,600	Mathieson Alkali	No	650,436	1.50	1.44	1.20
100⅛	103	79	94¾	55	61⅝	39	12,100	129,300	Monsanto Chem.	10	864,000	1.50	3.84	3.03
28¼	31⅜	26⅜	20⅝	14½	17	13½	34,300	131,300	National Lead	10	3,098,310	.50	1.08	.84
165	168	158	162½	150	146½	122	300	1,800	7% cum. "A" pfd.	100	243,676	7.00	25.40	20.12
144	144	137¾	140½	121⅝	121½	100½	90	2,910	6% cum. "B" pfd.	100	103,277	6.00	49.05	35.36
14⅞	15¾	9	10⅞	4⅜	13	5½	203,700	801,500	Newport Industries	1	519,347	None	.57	.31
144½	164	128	129	80	94	60	6,200	100,900	Owens-Illinois Glass	25	1,200,000	5.00	6.52	5.41
45	49	40¼	53¾	42⅜	44⅜	33⅛	22,500	200,200	Procter & Gamble	No	6,410,000	1.75	.....	p 2.23
120	122½	117¾	121	115	117	102½	100	3,130	5% pfd. (ser. 2-1-29)	100	171,569	5.00	.....	p88.13
7	10¼	5⅝	8¾	4	6¾	3⅛	30,900	383,000	Tenn. Corp.	5	857,896	None	.22	.27
38⅜	39⅛	33	36¾	28¾	43¼	30	62,100	394,800	Texas Gulf Sulphur	No	2,540,000	2.00	1.94	1.81
95¼	100	71⅝	75¾	44	50⅞	35⅞	62,900	584,000	Union Carbide & Carbon	No	9,000,743	2.40	3.06	2.28
87	87¼	68	78	46	50⅜	35	8,500	106,300	United Carbon	No	370,127	2.40	4.71	3.55
34¼	59	31¼	50⅝	35⅛	64¾	32	48,800	385,890	U. S. Indus. Alco.	No	391,033	1.00	2.16	4.04
23½	27¼	16¼	21¾	11¼	31¾	14	55,800	365,900	Vanadium Corp.-Amer.	No	366,637	None	—1.13	—2.29
4⅝	8⅜	4⅛	4⅝	2½	5⅜	1⅞	19,600	340,600	Virginia-Caro. Chem.	No	486,000	None	.....	p—.79
33	48¾	28¾	35¾	17½	26	10	22,000	218,200	6% cum. part. pfd.	100	213,392	None	.....	p4.20
25¼	32	19¾	25½	16¾	27¼	14⅞	45,700	120,900	Westvaco Chlorine	No	284,962	.50	1.63	1.55
NEW YORK CURB EXCHANGE														
33⅝	40¾	29¼	30	15	22½	14⅝	54,500	404,000	Amer. Cyanamid "B"	No	2,404,194	.60	1.61	.99
2¾	3¾	2½	4	2	4⅛	2⅜	200	9,300	British Celanese Am. R.	10	2,806,000	None	—.71%	—.58%
102	116¼	99¼	115	90	105¼	81	1,400	8,970	Celanese, 7% cum. 1st pfd.	100	144,379	7.00	21.96	16.37
111⅝	116	107¼	111¼	97½	102	83	925	6,325	7% cum. prior pfd.	100	213,668	7.00	35.34	28.13
11	16½	10½	15	7	19	7	....	5,450	Celluloid Corp.	15	194,952	None	—.95	—1.67
12¼	15	11⅞	14½	11⅝	14⅜	10½	500	4,200	Courtaulds' Ltd.	1 £	24,000,000	7½%	7.51%	7.57%
113¾	124¾	94⅛	105½	80½	91	67½	7,600	48,700	Dow Chemical	No	945,000	2.40	4.42	3.32
6⅛	10¾	5	12½	6¼	10¾	4	12,400	83,200	Duval Texas Sulphur	No	500,000	None	.16	z .25
47	55	42	58	37	40¾	19	600	6,200	Heyden Chem. Corp.	10	147,600	1.25	3.22	3.07
130½	140	98¼	97¼	46¾	57½	39	6,900	55,540	Pittsburgh Plate Glass	25	2,141,305	4.00	5.32	2.69
126	145½	117	128⅞	84	90½	47¼	3,550	56,050	Sherwin Williams	25	635,583	4.00	.....	y6.19
110¾	116	110	113½	106	109¾	100	180	4,130	5% pfd. cum.	100	155,521	5.00	.....	y33.17
PHILADELPHIA STOCK EXCHANGE														
145	146¾	114¼	116¾	76½	75	50¼	220	2,315	Pennsylvania Salt	50	150,000	5.00	v5.57	v5.94

1936 August Last	1936 August High	1936 August Low	1935 High	1935 Low	1934 High	1934 Low	Sales August 1936	Sales 1936	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
111¾	117½	110¾	116	104½	106¾	83⅞	325,000	2,779,000	Amer. I. G. Chem. Conv. 5½'s	1949	5½	M. N.	29,929,000
32	34½	23½	29¾	7⅜	17¾	5	47,000	1,482,000	Anglo Chilean s. f. deb. 7's	1945	7	M. N.	12,700,000
97	101¾	92½	94½	77⅜	88	61½	158,000	794,000	By-Products Coke Corp. 1st 5½'s "A"	1945	5½	M. N.	4,932,000
99½	102¾	96¾	100¼	91⅛	92	62	102,000	802,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1942	5	M. N.	5,994,100
33	35¾	21	21½	7	19½	5⅛	1,019,000	9,194,000	Lautaro Nitrate conv. b's	1954	6	J. J.	31,357,000
94	97	66½	94	65	98½	89⅞	16,000	38,000	Montecatini Min & Agric. deb. 7's with war.	1937	7	J. J.	7,075,045
24½	35	24½	38	32⅛	74½	34½	......	30,000	Ruhr Chem. 6's	1948	6	A. O.	3,156,000
104¼	105	103	104	91½	90	65½	42,000	378,000	Tenn. Corp. deb. 6's "B"	1944	6	M. S.	3,007,900
91⅞	95¾	85¾	94¼	66	89½	62	203,000	836,000	Vanadium Corp. conv. 5's	1941	5	A. O.	4,261,000

† Year ended 5-31-35; *p* Year ended 6-30-35; *v* Years ended 6-1-35 and 6-1-36; *y* Year ended 8-31-35; *z* Year ended 8-31-35; * Including extras; *x* Year ended 10-31-35.

Industrial Trends

¶ August Business Rate of Activity Proves Highly Encouraging—Steel Production Makes New 6-Year Record—Electrical Consumption at New All-Time High—Commodity Prices Advance—Heavy Chemical Shipments—

August rate of activity was highly satisfactory in the majority of industries, comparing favorably with July and, in certain instances, even surpassing the rates reached earlier in the summer period. It can now be definitely stated that the usual summer seasonal dip was far less pronounced than it has been in 6 years. In some fields, in fact, there has been no "dip," but in its place a steady and progressive rate of increase in activity. This was accomplished despite several uncertainties, of which the political was and, of course, still is the most important and with the foreign situation running a poor second.

Retail trade in the past month was 12 to 15% greater than in the corresponding period of last year, while wholesale trade was reported 18 to 25% ahead. Wholesalers are extremely optimistic over the fall business already placed. With Labor Day very late this year, there may be some temporary lag in the usual fall pick-up in both retail and wholesale trade, but in both groups the feeling exists that this will quickly be made up in the last half of September.

Steel activity reached a new 6-year top in August. A new all-time record for electrical consumption was likewise reported. Highly encouraging is the showing made by the carloading figures and the revenue reports of the railroads. The *N. Y. Times* Index of Business Activity entered new high ground in the past 30-day period. On the other hand, August was a relatively poor month for production in the automotive centers, due to the shut-downs preparatory to the introduction of the '37 models, and this slackness is likely to carry over into early September. The rubber tire centers are active, the companies determined to build up a reserve to offset the possibility of further labor troubles. Part at least of the present activity in the steel mills can be attributed to the same reason, but the labor outlook in Pittsburgh and Youngstown is decidedly better than it was a month ago.

Commodity prices advanced last month, the increases in some instances, and particularly in corn, being rather spectacular. In many sections of the mid-west the drought conditions have been more severe than they were in '34. The corn states have been the worst sufferers and the smallest crop in years appears to be a certainty. The Federal Government is pouring large relief sums into these areas so that the retail merchant is not feeling the blow as heavily as he otherwise would, but, of course, in the long run the bill, along with the many others of similar nature, will be paid in one way or another. The steadily rising cost of living is beginning to be a very popular topic of general conversation and further advances in rents and food are expected. This is bound to be reflected in the labor outlook.

On the optimistic side of the picture the immediate outlook is bright, at least according to the statements of the Dept. of Commerce officials, who estimate that the national income in '36 will reach 60 billion as against a record peak of 80 billion in '29, and that for the 1st time in 7 years business will balance its outlay.

August Chemical Consumption

Chemical consumption in August was approximately equal to that of July and about 15 to 20% ahead of August of last year. Alkali shipments were heavy to the rayon field and there was some pick-up in the consumption of chemicals in the textile processing and dyeing fields. Due to the temporary slump in automotive production plating chemicals and certain of the solvents were not in as active demand, and a definite decline was reported in the call for paint raw materials. Shipments to the glass, tanning, and paper nidustries were in good volume. Of special interest was the continued upward trend in quotations on most of the raw fertilizer materials. The mixed fertilizer producer will be up against a difficult problem in the next season unless he can pass along the higher costs to the farmer and the past history of the industry is all against his being able to do this.

The chemical industry is very definitely interested in the sudden rise in platinum to $63 per oz. Rumors of the formation of platinum cartel are denied and the rise is largely attributed to a better demand from the jewelry field and a sudden interest on the part of speculative elements.

Contract Season Approaches

The chemical industry is on the verge of another contract season. That the Robinson-Patman Act will add a great deal of confusion is a generally accepted fact. There may be considerable shifting of tonnages around among the producers, and in many quarters it is thought that the Act will have a bullish effect on the price structure.

Statistics of Business

	July 1936	July 1935	June 1936	June 1935	May 1936	May 1935
Automotive production	440,999	332,109	454,487	356,340	460,565	361,107
Bldg. contracts*‡	$294,834	$159,258	$233,055	$148,005	$216,071	$126,720
Failures, Dun & Bradstreet	639	902	733	944	832	......
Merchandise imports‡	$193,622	$176,631	$192,233	$156,754	$191,110	$170,533
Merchandise exports‡	$178,324	$173,230	$185,188	$170,244	$201,042	$165,459
Newsprint Production						
Canada, tons	274,627	234,266	270,051	232,020	267,067	242,693
U. S., tons	73,361	73,108	79,830	77,339	75,719	84,323
Newfoundland, tons	29,246	29,336	27,980	27,559	......	......
Plate glass prod., sq. ft. ..	16,427,849	13,908,529	16,243,665	13,162,515	19,192,114	14,581,557
Steel ingots production, tons	3,922,000	2,267,000	3,984,845	2,258,664	4,046,253	2,633,661
Steel activity, % capacity..	......	......	69.83	40.81	70.91	44.06
Pig iron production, tons..	2,594,000	1,520,000	2,586,240	1,552,514	2,648,401	1,727,095
U. S. consumption, crude rubber, tons	48,127	35,917	52,636	36,623	50,482	41,568
Tire shipments	......	5,447,109	......	4,262,360	5,831,964	4,067,386
Tire production	......	3,531,834	......	3,909,832	4,970,993	4,175,170
Tire inventory	......	8,849,503	......	10,755,400	8,176,296	11,130,765
Dept. of Labor Indices†						
Factory payrolls, totals†..	77.8	78.7	79.5	66.4	79.3	68.5
Factory employment† ...	87.7	86.3	86.0	79.7	85.7	81.2
Chemical employment†*a* ..	115.3	109.0	111.7	106.4	110.3	108.0
Chemical payrolls†*a* ...	103.7	95.4	108.9	98.0	107.0	94.1
Chemicals and Related Products						
Exports‡	......	......	$8,138	$9,081	$10,796	$8,900
Imports‡	......	......	$4,656	$5,752	$6,348	$7,303
Stocks, mfg. goods	......	......	121	117	122	116
Stocks, raw materials ...	......	......	71	81	108	121
Anthracite ship., tons	3,345,309	3,031,987	*y*3,515,878	4,878,783	4,557,000	4,346,863
Bituminous prod., tons ...	......	22,252,000	*y*29,415,000	30,117,000	28,541,000	26,790,000
Boot and shoe production ..	34,867,859	32,274,469	29,006,845	26,485,379	29,426,630	31,258,148

Week Ending	Carloadings 1936	Carloadings 1935	Carloadings % of Change	Electrical Output§ 1936	Electrical Output§ 1935	Electrical Output§ % of Change	Jour. of Com. Price Index	National Fertilizer Association Indices: Chem. & Drugs	Fats & Oils	Fert. Mat.	Mixed Fert.	All Groups	‡‡Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher's Index Pur. Power
Aug. 1	747,551	595,297	+25.6	2,079,137	1,821,398	+14.2	82.7	94.6	77.6	66.5	73.1	79.5	78.9	71.4	102.7	119.5
Aug. 8	728,293	582,077	+25.1	2,079,149	1,819,371	+14.3	82.3	94.6	79.0	66.9	73.1	79.9	78.8	70.0	103.2	118.7
Aug. 15	736,497	614,005	+19.9	2,093,928	1,832,695	+14.3	82.8	94.6	80.7	67.2	73.1	80.3	79.2	72.2	102.1	119.1
Aug. 22	734,973	625,774	+17.5	2,125,502	1,839,815	+15.5	82.8	94.6	81.3	67.3	73.7	80.1	79.5	72.5	103.6	118.9
Aug. 29	......	......	.....	2,135,598	1,809,716	+18.0	81.2	...	...	...	...	...	...	...	....	119.3

* 37 states; † Dept. of Labor, 3 year average, 1923-1925 = 100.0; ‡ 000 omitted; § K.W.H., 000 omitted; *a* Includes all allied products but not petroleum refining; ‡‡ 1926-1928 = 100.0; *y* Preliminary; *r* Revised.

Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1935 Average $1.21 - Jan. 1936 $1.19 - August 1936 $1.19

	Current Market		1936		1935	
			Low	High	Low	High
Acetaldehyde, drs, c-l, wgs lb.	...	.14	...	.14	...	.14
Acetaldol, 95%, 50 gal drs wks ....lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kegs..lb.	.38	.43	.38	.43	.38	.43
Acetanalid, tech, 150 lb bbls lb.	.24	.26	.24	.26	.24	.26
Acetic Anhydride, 100 lb cbys lb.	.21	.25	.21	.25	.21	.25
drs, f.o.b. wks, frt allowed ....lb.	...	.15	...	...	...	...
Acetin, tech, drs ....lb.	.22	.24	.22	.24	.22	.24
Acetone, tks, f.o.b. wks, frt allowed ....lb.	...	.07	.07	.12	.11	.12
drs, c-l, f.o.b. wks, frt allowed ....lb.	...	.08	.08	.12	...	.12
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls ....lb.	.06¾	.07	.06¾	.07	.06¾	.07
Acetic, 28%, 400 lb bbls, c-l, wks ....100 lbs.	...	2.45	...	2.45	2.40	2.45
glacial, bbls, c-l, wks 100 lbs.	...	8.43	...	8.43	8.25	8.43
glacial, USP, bbls, c-l, wks ....100 lbs.	...	12.43	...	12.43	12.25	12.43
Adipic, kgs, bbls ....lb.	...	.72	...	.72	...	.72
Anthranilic, refd, bbls ....lb.	.85	.95	.85	.95	.85	.95
tech, bbls ....lb.	...	.75	...	.75	...	.75
Battery, cbys, delv ...100 lbs.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb kgs ..lb.	.40	.45	.40	.45	.40	.45
USP, 100 lb kgs ....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ....ton *a*	...	95.00	...	95.00	80.00	95.00
Broenner's, bbls ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 95%, cbys ....lb.	.53	.60	.53	.60	.53	.60
edible, c-l, wks, cbys ...lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs ....lb.	...	.22	...	.22	...	.22
wks ....lb.	...	.23	...	.23	...	.23
tks, wks ....lb.	...	.21	...	.21	...	.21
Camphoric, drs ....lb.	...	5.25	...	5.25	...	5.25
Chicago, bbls ....lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks ....lb.	.03½	.05	.03½	.05	.03½	.05½
Chromic, 99¾%, drs, delv lb.	.14¾	.16¾	.14¾	.16¾	.13¾	.16¾
Citric, USP, crys, 230 lb bbls ....lb. *b*	.26	.27	.26	.29	.28	.29
anhyd, gran, bbls ....lb. *b*	...	.29	.29	.31	...	.31
Cleve's, 250 lb bbls ....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.63	.65	.51	.65	.46	.53
99%, straw, LB, drs, wks, frt equal ....gal.	.73	.75	.68	.75	.64	.68
resin grade, drs, wks, frt equal ....gal.	.63	.65	.52	.65	.52	.55
Crotonic, drs ....lb.	.90	1.00	.90	1.00	.90	1.00
Formic, tech, 140 lb drs ..lb.	.11	.13	.11	.13	.11	.13
Fumaric, bbls ....lb.	...	.60	...	.60	...	.60
Fuming, see Sulfuric (Oleum)						
Fuoric, tech, 90%, 100 lb. drs lb.	...	.35	...	.35	...	.35
Gallic, tech, bbls ....lb.	.65	.68	.65	.68	.65	.68
USP, bbls ....lb.	.70	.80	.70	.80	.70	.80
Gamma, 225 lb bbls, wks..lb.	.80	.84	.80	.84	.77	.79
H, 225 lb. bbls, wks....lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 10% sol. cbys ....lb.	.50	.51	.50	.51	.50	.51
Hydrobromic, 48% com 155 lb cbys, wks ....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, see muriatic.						
Hydrocyanic, cyl, wks ....lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks ....lb.	.07	.07½	.07	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks ....lb.	.11	.12	.11	.12	.11	.12
Lactic, 22%, dark, 500 lb bbls lb.	.04½	.05	.04½	.05	.04½	.05
22%, light refd, bbls ...lb.	.06½	.07	.06½	.07	.06½	.07
44%, light, 500 lb bbls ..lb.	.11½	.12	.11½	.12	.11½	.12
44%, dark, 500 lb bbls ..lb.	.09½	.10	.09½	.10	.09½	.10
50%, water white, 500 lb bbls ....lb.	...	.14½	...	.14½	...	...
USP X, 85%, cbys ....lb.	.45	.50	.45	.50	.45	.50
Laurent's, 250 lb bbls ....lb.	.46	.47	.46	.47	.36	.37
Linoleic, bbls ....lb.	.16	.16	.16	.16	.16	.16
Maleic, powd, kgs ....lb.	.29	.32	.29	.32	.29	.32
Malic, powd, kgs ....lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks ....N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls ....lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.

	Current Market		1936		1935	
			Low	High	Low	High
Muriatic, 18°, 120 lb cbys, c-l, wks ....100 lb.	...	1.35	...	1.35	...	1.35
tks, wks ....100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks ..100 lb.	...	1.45	...	1.45	...	1.45
tks, wks ....100 lb.	...	1.20	...	1.20	...	1.20
22°, c-l, cbys, wks ..100 lb.	...	1.95	...	1.95	...	1.95
tks, wks ....100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys ....lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls ....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.11	.14	.11	.14	.11	.14
Sludges, drs ....lb.	.06	.10	.06	.10	...	...
Naphthionic, tech, 250 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks ....100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks..100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks..100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks..100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N. Y. ....lb.	.11½	.12½	.11½	.12½	.11½	.12½
Phosphoric, 50%, USP, cbys ....lb.	.14	.14	.14	.14	.14	.14
50%, acid, c-l, drs, wks..lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks..lb.	.09	.10½	.09	.10½	.09	.10½
Picramic, 300 lb bbls, wks. lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks ....lb.	.30	.40	.30	.40	.30	.40
Propionic, 98% wks, drs..lb.	...	.35	...	.35	...	.35
80% ....lb.	.15	.17½	.15	.17½	.15	.17½
Pyrogallic, crys, kgs, wks..lb.	1.55	1.65	1.55	1.65	1.55	1.65
Salicylic, tech, 125 lb bbls, wks ....lb.	...	.40	...	.40	...	.40
Sebacic, tech, drs, wks ....lb.	...	.58	...	.58	...	.58
Succinic, bbls ....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	.18	.19	.18	.19	.18	.19
Sulfuric, 60°, tks, wks ..ton	...	11.00	...	11.00	...	11.00
c-l, cbys, wks ....100 lb.	...	1.10	...	1.10	...	1.10
66°, tks, wks ....ton	...	15.50	...	15.50	...	15.50
c-l, cbys, wks ....100 lb.	...	1.35	...	1.35	...	1.35
CP, cbys, wks ....lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran powd, 300 lb bbls ....lb.	...	.24	...	.24	.24	.25
Tobias, 250 lb bbls ....lb.	.70	.72½	.70	.72½	.70	.80
Trichloroacetic bottles ....lb.	2.45	2.75	2.45	2.75	2.45	2.75
kgs ....lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls ....lb.	1.50	1.60	1.50	1.60	1.50	1.60
Vanadic, drs, wks ....lb.	1.10	1.20	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb bbls ....lb.	.50	.60	.50	.60	.45	.60
dark, bbls ....lb.	.12	.17	.12	.17	.12	.17
egg, edible ....lb.	.77	.79	.77	1.05	.85	1.05
vegetable, edible ....lb.	.65	.70	.65	.70	.65	.70
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.143	...	.143	...	...
c-l, drs, delv ....lb.	...	.150	...	.150	...	...
lcl, drs, delv ....lb.	...	.157	...	.157	...	...
Amyl, secondary, tks, delv ....lb.	...	.108	...	.108	...	.108
Benzyl, bottles ....lb.	.65	1.10	.65	1.10	.65	1.10
Butyl, normal, tks, f.o.b. wks, frt allowed....lb. *d*	...	.08½	.08½	.11	.11	.12
c-l, drs, f.o.b. wks, frt allowed ....lb. *d*	...	.09½	.09½	.12	.12	.13
Butyl, secondary, tks, delv ....lb. *d*	...	.07½	.07½	.096	...	.096
c-l, drs, delv ....lb. *d*	...	.08½	.08½	.106	...	.106
Capryl, drs, tech, wks ..lb.	...	.85	...	.85	...	.85
Cinnamic, bottles ....lb.	3.25	3.65	3.25	3.65	3.25	3.65
Denatured, SD, No. 1, tks, 13. c-l. drs, wks ...gal. *e*	...	.34	.34	.44*	.34	.49*
Western schedule, c-l, wks ....gal. *e*	...	.39	.39	.52*	.38	.52*
Denatured, SD, No. 1, tks, wks ....gal. *e*	...	.23	.23	.28	.29½	.31
c-l, drs, wks ....gal. *e*	...	.29	.29	.34	.34½	.36
Diacetone, tech, tks, delv lb. *f*	...	.16	...	.16	...	.16
c-l, drs, delv ....lb. *f*	...	.17	...	.17	...	.17

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case; * Dealers were given 20% off this price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Prices—Current

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Alcohols (continued)						
Ethyl, 190 proof, molasses, tks ....gal. g	...	4.07	4.07	4.10	4.08½	4.10
c-l, drs ....gal. g	...	4.13	4.12	4.27	4.13½	4.27
c-l, bbls ....gal. g	...	4.14	4.13	4.28	4.15½	4.28
absolute, drs ....gal. g	4.54	6.08½	4.54	6.11½	4.55½	6.11½
Furfuryl, tech, 500 lb drs lb.	...	.35	...	.35	...	.35
Hexyl, secondary tks, delv ....lb.	...	.11½	...	.11½	...	.11½
c-l, drs, delv ....lb.	...	.12½	...	.12½	...	.12½
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	...
drs, lcl, delvd ....lb.	...	.27	...	.27	...	...
Isobutyl, refd, lcl, drs ..lb.	...	.10	.10	.12	.12	.60
c-l, drs ....lb.	...	.09½	.09½	.11½	...	...
tks ....lb.	...	.08½	.08½	.10½	...	...
Isopropyl, refd, c-l, drs, f.o.b. wks, frt allowed ..lb.	...	.55	...	.55	...	.55
Propyl, norm, 50 gal drs gal.	...	.75	...	.75	...	.75
Special Solvent, tks, wks gal.	...	.24	.24	.32	...	...
Aldehyde ammonia, 100 gal drs ....lb.	.80	.82	.80	.82	.80	.82
Alphanaphthol, crude, 300 lb bbls ....lb.	.60	.65	.60	.65	.60	.65
Alphanaphthylamine, 350 lb bbls ....lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.00	...	3.00	...	3.00
25 bbls or more, wks ....100 lb.	...	3.15	...	3.15	...	3.15
less than 25 bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
Granular, c-l, bbls, wks ....100 lb.	...	2.75	...	2.75	...	2.75
25 bbls or more, wks 100 lb.	...	2.90	...	2.90	...	2.90
Powd, c-l, bbls, wks 100 lb.	...	3.15	...	3.15	...	3.15
25 bbls or more, wks 100 lb.	...	3.30	...	3.30	...	3.30
Chrome, bbls ....100 lb.	7.00	7.25	7.00	7.25	7.00	7.25
Potash, lump, c-l, bbls, wks ....100 lb.	...	3.25	...	3.25	...	3.25
25 bbls or more, wks 100 lb.	...	3.40	...	3.40	...	3.40
Granular, c-l, bbls, wks ....100 lb.	...	3.40	...	3.40	...	3.00
25 bbls or more, bbls, wks ....100 lb.	...	3.00	...	3.00	...	3.15
Powd, c-l, bbls, wks 100 lb.	...	3.40	...	3.40	...	3.40
25 bbls or more, wks 100 lb.	...	3.55	...	3.55	...	3.55
Soda, bbls, wks ....100 lb.	4.00	4.15	4.00	4.15	4.00	4.15
Aluminum metal, c-l, NY 100 lb.	19.00	20.00	19.00	20.00	19.00	23.30
Acetate, CP, 20%, bbls lb.	.09	.10	.09	.10	.09	.10
Chloride anhyd, 99%, wks lb.	.07	.12	.07	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks ..lb.	.06½	.07	.06½	.07	.06½	.07
Solution, drs, wks ....lb.	.03	.03½	.03	.03½	.03	.03½
Hydrate, 96%, light, 90 lb. bbls, delv ....lb.	.13	.15	.13	.15	.13	.15
heavy, bbls, wks ....lb.	.04	.04½	.04	.04½	.04	.04½
Oleate, drs ....lb.	...	.15¾	...	.15¾	...	.15¾
Palmitate, bbls ....lb.	.21	.22	.21	.22	.20	.22
Resinate, pp., bbls ....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls ...lb.	.18	.20	.18	.20	.17	.20
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.35	...	1.35	...	1.35
c-l, bbls, wks ....100 lb.	...	1.55	...	1.55	...	1.55
Sulfate, iron-free, c-l, bgs, wks ....100 lb.	...	1.90	...	1.90	...	1.90
c-l, bbls, wks ....100 lb.	...	2.05	...	2.05	...	2.05
Aminoazobenzene, 110 lb kgs ....lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd com, tks..lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.15¾	.21½	.15¾	.21½	.15¾	.21½
26°, 800 lb drs, delv ....lb.	.02½	.03	.02½	.03	.02½	.03
Aqua 26°, tks, NH ..cont.	...	.05	...	.05	...	.05
tk wagon ....lb.	...	.024	...	.024	...	.024
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. plant ....100 lb.	5.15	5.71	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls ..lb.	.15	.17	.15	.17	.15	.17
carbonate, tech, 500 lb bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks ....100 lb.	4.45	4.90	4.45	4.90	4.45	4.90
Gray, 250 lb bbls, wks ..lb.	5.00	5.75	5.00	5.75	5.00	5.75
Lump, 500 lbs cks spot lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Linoleate ....lb.	.11	.12	.11	.12	.11	.12
Nitrate, tech, cks ....lb.	.04	.05	.04	.05	.04	.05
Oleate, drs ....lb.	...	.10	...	.10	...	.10
Oxalate, neut, cryst, powd, bbls ....lb.	.26	.27	.26	.27	.26	.27
pure, cryst, bbls, kgs..lb.	.27	.28	.27	.28	.27	.28
Perchlorate, kgs ....lb.	...	.16	...	.16	...	.16
Persulfate, 112 lb kgs ..lb.	.22½	.25	.22½	.25	.22½	.25
Phosphate, dibasic tech, powd, 325 lb bbls ....lb.	.07½	.10	.07½	.10	.08	.10
Sulfate, dom, f.o.b., bulk ton	...	25.50	22.00	26.00	20.00	24.00
200 lb bgs ....ton	...	nom.	...	nom.	25.50	25.80
100 lb bgs ....lb.	...	nom.	...	nom.	26.00	26.50
Sulfocyanide, kgs ....lb.	...	.55	...	.55	...	.50
Amyl Acetate (from pentane) tks, delv ....lb.	...	.13½	...	.13½	...	.13½
tech, drs, delv ....lb.	.142	.149	.142	.149	.142	.149
secondary, tks, delv ..lb.	...	.108	...	.108	...	.108
c-l, drs, delv ....lb.	.118	.123	.118	.123	.118	.123
Amyl Chloride, norm drs, wks ....lb.	.56	.68	.56	.68	.56	.68
Chloride, mixed, drs, wks lb.	.07	.077	.07	.077	.07	.077
tks, wks ....lb.	...	.06	...	.06	...	.06
Mercaptan, drs, wks ....lb.	...	1.10	...	1.10	...	1.10

g Grain alcohol 20c a gal. higher in each case.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks ....lb.	.15	.17½	.15	.17½	.15	.17½
Annatto fine ....lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80% ....lb.	...	.75	...	.75	...	.75
40% ....lb.	...	.18	...	.18	...	.18
Anthraquinone, sublimed, 125 lb bbls ....lb.	.50	.52	.50	.52	.50	.52
Antimony metal slabs, ton lots ....lb.	.11½	.12½	.11¾	.13½	.12½	.16
Needle, powd, bbls ....lb.	.11½	.12	.11	.12½	.09	.13½
Butter of, see Chloride.						
Chloride, soln cbys ....lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls ....lb.	.12¾	.13	.12¾	.14	.10¼	.15
Salt, 63% to 65%, tins..lb.	.22	.24	.22	.24	.22	.24
Sulfuret, golden, bbls...lb.	.22	.23	.22	.23	.19	.23
Vermilion, bbls ....lb.	.35	.42	.35	.42	.35	.42
Archil, conc, 600 lb bbls ..lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Triple, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Argols, 80%, casks ....lb.	.14	.15	.14	.15	.15	.16
Crude, 30%, casks ....lb.	.07	.08	.07	.08	.07	.08
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbl ....lb.	.08¾	.09¾	.08¾	.09¾	.08¾	.09¾
Arsenic, Red, 224 lb cs kgs lb.	...	.15¾	...	.15¾	...	.15¾
White, 112 lb kgs ....lb.	.03½	.04½	.03½	.04½	.03½	.04½
Metal ....lb.	.40	.42	.40	.42	.40	.42
Asbestine, c-l, wks ....ton	13.00	15.00	13.00	15.00	13.00	15.00
Barium Carbonate precip, 200 lb bgs, wks ....ton	56.50	61.00	56.50	61.00	56.50	61.00
Nat (witherite) 90% gr, c-l, wks, bgs ....ton	42.00	45.00	42.00	45.00	42.00	45.00
Chlorate, 112 lb kgs NY lb.	.15½	.17½	.15½	.17½	.14	.17½
Chloride, 600 lb bbl, wks ton	72.00	74.00	72.00	74.00	72.00	74.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.12
Hydrate, 500 lb bbls ....lb.	.05½	.06	.05½	.06	.05½	.06
Nitrate, 700 lb cks ....lb.	...	.08¼	...	.08¼	...	.08¼
Barytes, floated, 350 lb bbls wks ....ton	23.65	31.15	23.65	31.15	23.00	31.15
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, No. 1, bgs, wks ....ton	...	16.50	...	16.50	16.50	18.00
No. 2 ....ton	...	11.00	...	11.00	11.00	12.50
Benzaldehyde, tech, 945 lb drs, wks ....lb.	.60	.62	.60	.62	.60	.62
Benzene (Benzol), 90%, Ind, 8000 gal tks, frt allowed ....gal.	...	.16	.16	.18	.15	.18
90% c-l, drs ....gal.	...	.23	...	.23	.23	.24
Ind Pure, tks, frt allowed ....gal.	...	.16	.16	.18	.15	.18
Benzidine Base, dry, 250 lb bbls ....lb.	.72	.74	.72	.74	.67	.69
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, tech, drs..lb.	.30	.40	.30	.40	.30	.40
Beta-Naphthol, 250 lb bbl, wks ....lb.	.24	.27	.24	.27	...	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.53	.55	.53	.55	.53	.55
Bismuth metal	1.00	1.10	1.00	1.10	.90	1.20
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes ....lb.	3.15	3.20	3.15	3.20	3.15	3.20
Oxychloride, boxes ....lb.	2.95	3.00	2.95	3.00	2.95	3.00
Subbenzoate, boxes ....lb.	3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs ....lb.	1.40	1.45	1.40	1.45	1.55	1.70
Trioxide, powd, boxes...lb.	3.45	3.50	3.45	3.50	3.45	3.50
Subnitrate	1.30	1.35	1.30	1.35	1.30	1.45
Blackstrap, cane (see Molasses, Blackstrap).						
Blanc Fixe, 400 lb bbls, wks ....ton h	42.50	70.00	42.50	70.00	42.50	70.00
Bleaching Powder, 800 lb drs, c-l, wks, contract..100 lb.	...	2.00	...	2.00	1.90	2.00
lcl, drs, wks ....lb.	2.25	3.60	2.25	3.60	2.15	3.60
Blood, dried, f.o.b., NY..unit	...	4.00	2.50	4.00	2.50	3.25
Chicago, high grade ...unit	...	4.00	2.90	4.00	2.50	3.75
Imported shipt ....unit	3.45	3.50	2.60	3.50	2.75	3.30
Blues, Bronze Chinese Milori Prussian Soluble ....lb.	.37	.38½	.37	.38½	.36½	.38
Ultramarine,* dry, wks, bbls ....lb.	...	.10	...	.10	...	...
Regular grade, group 1 lb.	...	.15	...	.15	...	...
Special, group 1....lb.	...	.18	...	.18	...	...
Pulp, No. 1 ....lb.	...	.26	...	.26	...	...
Bone, 4½ + 50% raw, Chicago ....ton	23.00	25.00	20.00	25.00	19.00	22.00
Bone Ash, 100 lb kgs ....lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls ....lb.	.05½	.08¼	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, imp..ton	...	24.15	23.00	24.75	22.75	24.00
Domestic, bgs, Chicago..ton	...	18.00	16.00	20.00	16.00	21.00
Borax, tech, gran, 80 ton lots, sacks, delv ....ton i	...	40.00	...	40.00	36.00	40.00
bbls, delv ....ton i	...	50.00	...	50.00	46.00	50.00
c-l, sacks, delv ....ton i	...	44.00	...	44.00	40.00	44.00
c-l, bbls, delv ....ton i	...	54.00	...	54.00	50.00	54.00
Tech, powd, 80 ton lots, sacks ....ton i	...	45.00	...	45.00	41.00	45.00
bbls, delv ....ton i	...	56.00	...	56.00	51.00	56.00
c-l, sacks, delv ....ton i	...	49.00	...	49.00	45.00	49.00
c-l, bbls, delv ....ton i	...	59.00	...	59.00	55.00	59.00
Bordeaux Mixture, jobbers, East, c-l, tins, drs, cases lb.	.08	.16	.08	.16	.08	.16
Jobbers, West, c-l ....lb.	.08	.10	.08	.10	.08	.10
Dealers, East, c-l ....lb.	.08½	.16½	.08½	.16½	.08½	.16½
Dealers, West, c-l ....lb.	.09	.11	.09	.11	.09	.11

h Lowest price is for pulp, highest for high grade precipitated; i Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Bromine, cases ....lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.80	1.50	.80	1.50	.80	1.50
Gold, blk ....lb.	.40	.55	.40	.55	.40	.55
Butanes, com 16-32° group 3 tks ....lb.	...	.04	...	.04	...	.04
Butyl, Acetate, norm drs, frt allowed ....lb.	.09½	.10	.09½	.12½	.12	.13½
tks, frt allowed ....lb.	...	.08½	.08½	.11	.11	.13
Secondary, tks, frt allowed ....lb.	...	.07½	.07½	.096	...	.096
drs, frt, allowed .....lb.	.08½	.09	.106	.111	.106	.111
Aldehyde, 50 gal drs, wks ....lb.	.19	.21	.19	.21	.19	.21
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Lactate, drs ....lb.	.22½	.23½	.22½	.23½	.22½	.23½
Propionate, drs ....lb.	.18	.18½	.18	.18½	.18	.18½
tks, delv ....lb.	...	.17	...	.17	...	.17
Stearate, 50 gal drs ....lb.	...	.26	...	.26	...	.26
Tartrate, drs ....lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	...	...	...
Cadmium, Sulfide, boxes...lb.	.90	1.00	.90	1.10	.75	.85
Cadmium Metal ....lb.	...	1.05	.85	1.05	.55	.90
Calcium, Acetate, 150 lb bgs c-l, delv ....100 lb.	...	2.10	...	2.10	2.00	2.10
Arsenate, jobbers, East of Rocky Mts, drs ......lb.	.06	.06⅜	.06	.06⅜	.06	.06½
dealers, drs ....lb.	.06¼	.07¾	.06¼	.07¾	.06¼	.07¾
South, jobbers, drs .....lb.	.06	.06½	.06	.06½	.06	.06½
dealers, drs ....lb.	.06½	.06¾	.06½	.06¾	.06¼	.06¾
Carbide, drs ....lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ....lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, flake, 375 lb drs, c-l, wks ....ton	...	19.50	...	19.50	...	19.50
Solid, 650 lb drs, c-l, f.o.b. wks ....ton	...	17.50	...	17.50	...	17.50
Ferrocyanide, 350 lb bbls wks ....lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls ....lb.	.50	.57	.50	.57	...	...
Nitrate, 100 lb bgs ....ton	...	26.50	...	26.50	...	26.50
Palmitate, bbls ....lb.	.21	.22	.21	.22	.20	.22
Peroxide, 100 lb drs ....lb.	...	1.25	...	1.25	...	1.25
Phosphate, tech, 450 lb bbls ....lb.	.07½	.08	.07½	.08	.07½	.08
Resinate, precip, bbls ...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls ...lb.	.18	.20	.18	.20	.17	.20
Camphor, slabs ....lb.	...	.50	.50	.56	.49	.57
Powder ....lb.	.4940	.56	.4940	.56	.50	.57
Camwood, Bk, ground bbls lb.	.16	.18	.16	.18	.16	.18
Carbon, Decolorizing, drs c-l ....lb.	.08	.15	.08	.15	.08	.15
Black, c-l, bgs, delv, price varying with zone ....lb.	.0445	.0535	.0445	.0535	.0445	.0535
lcl, bgs, delv, all zones lb.	...	.07	...	.07	...	.07
cartons, delv ......lb.	...	.07¾	...	.07¾	...	.07¾
cases, delv ....lb.	...	.08¼	...	.08¼	...	.08¼
Bisulfide, 500 lb drs .... lb.	.05¼	.08	.05¼	.08	.05¼	.08
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 1400 lb drs, delv ....lb.	.05¼	.06	.05¼	.06	.05¼	.06
Casein, Standard, Dom, grd lb.	.17½	.18¾	.14½	.18¾	.09½	.16¾
80-100 mesh, c-l, bgs....lb.	.18	.19¾	.15	.19¾	.10	.17¼
Castor Pomace, 5½ NH_3, c-l, bgs, wks ....ton	...	15.00	15.00	15.50	16.00	18.50
Imported, ship, bgs ....ton	...	17.00	17.00	18.00	17.25	20.00
Celluloid, Scraps, ivory cs lb.	.17	.18	.17	.18	.17	.18
Transparent, cs ....lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs ....lb.	.55	.60	.55	.60	.55	.60
Chalk, dropped, 175 lb bbls lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks lb.	.03	.04	.03	.04	.03	.04
Light, 250 lb cks ....lb.	.03	.04	.03	.04	.03	.04
Charcoal, Hardwood, lump, blk, wks ....bu.	...	.15	...	.15	...	.15
Willow, powd, 100 lb bbl, wks ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bgs, delv* ....ton	24.40	25.40	24.40	25.40	22.40	30.00
Chestnut, clarified bbls, wks lb.	...	.01⅞	...	.01⅞	...	.01⅞
25%, tks, wks ....lb.	...	.01½	...	.01½	...	.01½
Pwd, 60%, 100 lb bgs. wks ....lb.	...	.04⅞	...	.04⅞	...	.04⅞
China Clay, c-l, blk mines ton	...	7.00	...	7.00	...	7.00
Powdered, bbls ....lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls, wks ..ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, blk ...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls, lcl, wks, contract ....lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract ...lb. *j*	...	.05½	...	.05½	...	.05½
Liq, tk, wks, contract 100 lb.	...	2.15	...	2.15	2.00	2.15
Multi, c-l, cyls, wks, cont ....lb.	2.30	2.55	2.30	2.55	2.30	2.40
Chloroacetophenone, tins, wks ....lb.	...	2.00	...	2.00	..	2.00
Chlorobenzene, Mono, 100 lb drs, lcl, wks ....lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ....lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ....lb.	.30	.31	.30	.31	.30	.31
Chloropicrin; comml cyls..lb.	.85	.90	.85	.90	.85	.90
Chrome, Green, CP ......lb.	.17	.18½	.17	.18½	.17	.30
Yellow ....lb.	.11	.12	.11	.12	.11	.16
Chromium, Acetate, 8% Chrome, bbls ....lb.	.06	.08	.06	.08	.05	.05¾
20° soln, 400 lb bbls .. lb.	...	.05½	...	.05½	..	.05½
Fluoride, powd, 400 lb bbl ....lb.	.27	.28	.27	.28	.27	.28

j A delivered price; * Depends upon point of delivery.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Coal tar, bbls ....bbl.	7.25	9.00	7.25	9.00	7.25	9.00
Cobalt Acetate, bbls ......lb.	...	.58	.58	.60	...	.60
Carbonate tech, bbls ....lb.	1.42¾	1.48	1.35	1.48	1.35	1.40
Hydrate, bbls ....lb.	1.66	1.76	1.66	1.76	1.66	1.76
Linoleate, paste, bbls ...lb.	...	.31¼	.30	.31¼	...	.30
Resinate, fused, bbls ...lb.	...	.13	.12½	.13	...	.12½
Precipitated, bbls ......lb.	...	.32	...	.32	...	.32
Oxide, black, bgs ......lb.	1.41	1.51	1.29	1.49	1.25	1.49
Cochineal, gray or bk bgs..lb.	.32	.36	.32	.36	.32	.39
Teneriffe silver, bgs ....lb.	.33	.37	.33	.37	.33	.40
Copper, metal, electrol 100 lb.	...	9.75	9.50	9.75	8.00	9.25
Carbonate, 400 lb bbls ..lb.	...	.08¼	...	.08¼	...	.08¼
52-54% bbls ....lb.	.14½	.16¼	.14½	.16¼	.14½	.16¼
Chloride, 250 lb bbls ...lb.	.17	.18	.17	.18	.17	.18
Cyanide, 100 lb drs ....lb.	.37	.38	.37	.38	.37	.38
Oleate, precip, bbls .....lb.	...	.20	...	.20	...	.20
Oxide, red, 100 lb bbls..lb.	.14	.15	.14	.15	.15	.17
black bbls, wks ......lb.	.14½	.15	.14½	.15	.14	.16½
Resinate, precip, bbls ...lb.	.18	.19	.18	.19	.18	.19
Stearate, precip, bbls ...lb.	.35	.40	.35	.40	.35	.40
Sub-acetate verdigris, 400 lb bbls ....lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.00	3.85	4.00	...	3.85
Copperas, crys and sugar bulk c-l, wks, bgs ....ton	14.00	16.00	13.00	16.00	12.00	14.00
Corn Syrup, 42 deg, bbls 100 lb.	...	3.95	3.05	3.95	3.18	3.63
43 deg, bbls .....100 lb.	...	4.05	3.10	4.05	3.23	3.68
Corn Sugar, tanners, bbls 100 lb.	...	4.03	3.08	4.03	3.46	3.66
Cotton, Soluble, wet, 100 lb bbls ....lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, USP, powd & gran, 300 lb bbls .....lb.	...	.16¼	.16¼	.16¾	.16¼	.17¼
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1, tks ......gal.	.12½	.13½	.12½	.13½	.11½	.13½
Grade 2 ....gal.	.109	.12	.109	.12	.10½	.12
Cresol, USP, drs ....lb.	.10	.10½	.10	.10½	.10	.11½
Crotonaldehyde, 98%, drs, wks ....lb.	.26	.30	.26	.30	.32	.36
Cudbear, English ....lb.	.19	.25	.19	.25	.19	.25
Cutch, Philippine, 100 lb bale lb.	.04	.04¾	.04	.04¾	.03½	.04¾
Cyanamid, bgs, c-l, frt allowed Ammonia unit	...	1.07½	...	1.07½	...	1.07½
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	4.85	4.90	3.45	5.00	3.60	4.15
British Gum, bgs ...100 lb.	5.20	5.25	3.70	5.40	3.85	4.50
White, 140 lb bgs ..100 lb.	4.80	4.90	3.40	4.95	3.50	4.10
Potato, Yellow, 220 lb bgs lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¾
White, 220 lb bgs, lcl..lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ....lb.	...	.08	...	.08	.08	.08¾
Diamylamine, drs, wks ...lb.	...	.75	.75	1.00	...	1.00
Diamylene, drs, wks ......lb.	.095	.102	.095	.102	.095	.102
tks, wks ....lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ....lb.	.085	.092	.085	.092	.085	.092
tks, wks ....lb.	...	.075	...	.075	...	.075
Diamylphthalate, drs wks gal.	.18	.19½	.18	.19½	.18	.20½
Diamyl Sulfide, drs, wks ..lb.	...	1.10	...	1.10	...	1.10
Dianisidine, bbls ....lb.	2.25	2.45	2.25	2.45	2.25	2.45
Dibutyl Ether, drs, wks, lcl lb.	...	.22	...	...	...	...
Dibutylphthalate, drs, wks, frt allowed ....lb.	...	.18	.18	.21	.20	.23
Dibutyltartrate, 50 gal drs lb.	.35	.40	.35	.40	.35	.40
Dichlorethylene, drs .....gal.	.29	...	.29	...	.29	...
Dichloroethylether, 50 gal drs, wks ....lb.	.16	.17	.16	.17	.16	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Dichloromethane, drs, wks lb.	...	.23	...	.23	.15	.23
Dichloropentanes, drs, wks lb.	.032	.040	.032	.040	.032	.040
tks, wks ....lb.	...	.02½	...	.02½	...	.02½
Diethanolamine, tks, wks..lb.	...	.30	...	.30	...	...
Diethylamine, 400 lb drs ..lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethyl Carbinol, drs .....lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31⅛	.35	.31⅛	.35	.31⅛	.35
90% grade, drs ....lb.	...	.25	...	.25	...	.25
Diethylaniline, 850 lb drs..lb.	.52	.55	.52	.55	.52	.55
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb drs ....lb.	.18½	.19	.18½	.19	.18½	.27
Diethylsulfate, tech, drs, wks, lcl ....lb.	...	.20	...	.20	...	...
Diethyleneglycol, drs .....lb.	.16½	.17½	.15½	.17½	.15½	.17½
Mono ethyl ethers, drs..lb.	.16	.17	.15	.17	.15	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Mono butyl ether, drs ..lb.	...	.26	...	.26	...	.26
Diethylene oxide, 50 gal drs, wks ....lb.	.20	.24	.20	.24	.20	.27
Diglycol Oleate, bbls .....lb.	...	.24	...	.24	.16	.24
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ....lb.	...	.95	...	.95	...	.95
Dimethylaniline, 340 lb drs lb.	.29	.30	.29	.30	.29	.30
Dimethyl Ethyl Carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt allowed ....lb.	.19½	.20	.19½	.21½	.20½	.24½
Dimethysulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls ....lb. *k*	.17	.19½	.17	.19½	.17	.19½
Dinitrochlorobenzene, 400 lb bbls ....lb.	.14	.15½	.14	.15½	.14	.15½
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	.15½	.16½	.15½	.16½	.15½	.16½
Diphenyl ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.31	.32	.31	.32
Diphenylguanidine, 100 lb bbl ....lb.	.35	.37	.35	.37	.36	.37

k Higher price is for purified material.

	Current	Market	1936 Low	1936 High	1935 Low	1935 High
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ....ton	32.00	35.00	32.00	45.00	36.00	40.00
Extract ....lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, dom., 200 lb cases ....lb.	...	.68	.63	.68	.46	.63
Imported ....lb.	.50	.55	.48	.56	...	...
Epsom Salt, tech, 300 lb bbls c-l NY ....100 lb.	1.80	2.00	1.80	2.00	1.80	2.25
USP, c-l, bbls .....100 lb.	...	2.00	...	2.00	2.00	2.25
Ether, USP anaesthesia 55 lb drs ....lb.	.22	.23	.22	.23	.22	.23
(Conc) ....lb.	.09	.10	.09	.10	.09	.10
Ether, Isopropyl 50 gal drs lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed ......lb.	...	.06	...	.06	...	.06
Nitrous, conc, bottles ...lb.	.75	.77	.75	.77	.75	.77
Synthetic, wks, drs ....lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester						
tks, frt alld ....lb.	...	.06	.06	.08	.07½	.08
drs, frt alld ....lb.	.07	.07½	.07½	.09	.08½	.09
Anhydrous, tks, frt alld..lb.	...	.07	.07	.08½	...	.08½
drs, frt alld ....lb.	.08	.08½	.08	.10	.09½	.10
Acetoacetate, 110 gal drs lb.	...	.37	.37	.68	.65	.68
Benzylaniline, 300 lb drs lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drs .....lb.	.50	.55	.50	.55	.50	.55
Chloride, 200 lb drs ....lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate cbys ...lb.	...	.30	...	.30	...	.30
Crotonate, drs ....lb.	1.00	1.25	1.00	1.25	1.00	1.25
Ether, Absolute, 50 gal drs ....lb.	.50	.52	.50	.52	.50	.52
Lactate, drs, wks ......lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs, frt allowed ....lb.	.07½	.08	.07½	.09	.08½	.09
tks, frt allowed ......lb.	...	.06½	.06½	.07½	...	.07½
Oxalate, drs, wks ......lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs, wks ....lb.	.30	.30½	.30	.30½	.30	.30½
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont .....lb.	.75	.85	.75	.85	.75	.85
Anhydrous ....lb.	...	.75	...	.75	...	...
Dichloride, 50 gal drs, wks ....lb.	.0545	.0994	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks lb.	.17	.21	.17	.21	.17	.28
tks, wks ....lb.	...	.16	...	.16	...	...
Mono Butyl Ether, drs. wks ....lb.	.20	.21	.20	.21	.20	.21
tks, wks ....lb.	...	.19	...	.19	...	.19
Mono Ethyl Ether, drs, wks ....lb.	.16	.17	.16	.17	.16	.17
tks, wks ....lb.	...	.15	...	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks ......lb.	...	.14	.14	.18½	.17½	.18½
tks, wks ....lb.	...	.13	.13	.16½	...	.16½
Mono, Methyl Ether, drs wks ....lb.	.19	.23	.19	.23	.19	.23
tks, wks ....lb.	...	.18	...	.18	...	...
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl ....lb.	.50	.55	.50	.60	.55	.75
Ethylidenaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, blk pottery ....ton	...	14.50	...	14.50	...	14.50
Powd, blk, wks ....ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground, wks ....unit *l*	...	3.25	2.50	3.25	2.25	2.90
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m*	...	nom.	...	2.25	2.00	2.35
Fluorspar, 98%, bgs .....lb.	30.00	35.50	30.00	35.50	28.00	35.50
Formaldehyde, USP, 400 lb bbls, wks ....lb.	.06	.07	.06	.07	.06	.07
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ....ton	6.50	15.00	6.50	15.00	6.50	15.00
Imp powd, c-l, bgs ....ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks..lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs ....lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.18	.16	.18	.16	.18
Fustic, chips ....lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes...lb.	.20	.23	.20	.23	.20	.23
Liquid 50°, 600 lb bbls..lb.	.08½	.12	.08½	.12	.08½	.12
Solid, 50 lb boxes.......lb.	.16	.18	.16	.18	.16	.18
Sticks ....ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls...lb.	.45	.47	.45	.47	.42	.43
Gall Extract ....lb.	.18	.20	.18	.20	.18	.20
Gambier, com 200 lb bgs..lb.	...	.06	...	.06	.05	.08
Singapore cubes, 150 lb bgs ....100 lb.	.08	.09	.08	.09	.07½	.09½
Gelatin, tech, 100 lb cs ...lb.	.50	.55	.50	.55	.50	.55
Glauber's Salt, tech, c-l, wks ....100 lb.	1.10	1.30	1.10	1.30	1.10	1.30
Anhydrous, see Sodium Sulfate.						
Glue, bone, com grades, c-l bgs ....lb.	.10½	.17½	.10½	.17½	...	...
Better grades, c-l, bgs lb.	.12	.17½	.12	.17½	...	...
Casein, kgs ....lb.	.18	.22	.18	.22	.18	.22
Glycerin, CP, 550 lb drs ..lb.	...	.17½	.16	.17½	.14	.14½
Dynamite, 100 lb drs ...lb.	...	.17½	.13¾	.17½	.13¾	.14½
Saponification, drs .....lb.	.14	.15	.10¼	.15	.10	.11½
Soap Lye, drs ....lb.	.13	.14	.09¼	.14	.09	.10

l + 10; *m* + 50.

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	Current Market		1936 Low	1936 High	1935 Low	1935 High
Glyceryl Phthalate ....lb.	...	.28	...	.28	...	.28
Glyceryl Stearate, bbls....lb.	...	.18	...	.18	...	.18
Glycol Phthalate ....lb.	...	.35	.29	.35	.28	.29
Glycol Stearate ....lb.	...	.23	...	.23	.18	.23
Graphite:						
Crystalline, 500 lb bbls ....lb.	.04	.05	.04	.05	.04	.05
Flake, 500 lb. bbls .....lb.	.08	.16	.08	.16	.08	.16
Amorphous, bbls ....lb.	.03	.04	.03	.04	.03	.04

GUMS

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Gum Aloes, Barbadoes ....lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts ......lb.	.09¾	.10	.09	.10¾	.09½	.15
White sorts, No. 1, bgs ....lb.	.27	.28	.25	.28	.21	.27
No. 2, bgs ....lb.	.25	.26	.24	.26	.19	.26
Powd, bbls ....lb.	.13	.14	.13	.14	.13¼	.18
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY ....lb.	.02½	.10½	.02½	.10½	.02½	.10½
Egyptian, 200 lb cases, f.o.b., NY ....lb.	.12	.15	.12	.15	.12	.15
California, f.o.b., NY, drs ....ton	29.00	55.00	29.00	55.00	29.00	55.00
Benzoin Sumatra, USP, 120 lb cases ....lb.	...	.16½	.15	.19	.19	.28
Copal, Congo, 112 lb bgs, clean, opaque ....lb.	...	.19½	.18½	.20	.19½	.24⅝
Dark amber ....lb.	...	.07⅛	.07⅛	.08	.07¼	.09¼
Light amber ....lb.	...	.11¼	.11¼	.14⅛	.11½	.14⅞
Copal, East India, 180 lb bgs						
Macassar pale bold ....lb.	.12⅝	.13¼	.12⅝	.14	.09½	.10¾
Chips ....lb.	.06⅛	.06½	.06⅛	.06½	.05½	.06
Nubs ....lb.	...	.11⅛	.10⅞	.11⅛	...	...
Dust ....lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.04½
Singapore						
Bold ....lb.	...	.15½	.15⅛	.16⅞	.12⅝	.17
Chips ....lb.	...	.04⅜	.04⅜	.05¼	.04⅝	.05⅝
Nubs ....lb.	...	.10	.10	.11¼	.10	.11¾
Dust ....lb.	.03⅝	.04⅛	.03⅝	.04⅛	.03⅝	.05½
Copal Manilla, 180-190 lb baskets, Loba A .....lb.	...	.10¾	.10¾	.13	.11¾	.13
Loba B ....lb.	...	.09⅞	.09⅞	.12	.10¼	.12
Loba C ....lb.	...	.09⅜	.09⅜	.11⅛	.10⅛	.11½
MA sorts ....lb.	...	.06¾	.06¾	.07⅝	.06	.07⅝
DBB ....lb.	.08	.08⅞	.08	.08⅞	.08	.09
Dust ....lb.	...	.05¼	.05¼	.06⅛	.04⅞	.06⅛
Copal Pontianak, 224 lb cases, bold genuine ....lb.	.14¼	.14¾	.14¼	.16	.14⅜	.16⅝
Mixed ....lb.	.13¼	.13¾	.13¼	.13¾	.12⅞	.14⅞
Chips ....lb.	.07⅜	.07⅞	.07	.07⅞	.06⅞	.08¼
Nubs ....lb.	.10¼	.10½	.10¼	.10½	.09⅝	.11¾
Split ....lb.	.12⅞	.13	.12⅞	.13	.12⅜	.13⅞
Dammar Batavia, 136 lb cases						
A ....lb.	.21¾	.22¼	.21⅜	.22¼	.19	.21⅞
B ....lb.	.20¾	.21½	.20⅜	.21½	.18	.20⅞
C ....lb.	...	.16⅝	.16½	.17⅝	.16	.17
D ....lb.	.14¼	.14⅜	.13⅝	.14⅜	.11¾	.14⅝
A/D ....lb.	...	.16¾	.15½	.17	.14	.16
A/E ....lb.	.13½	.13⅝	.13⅛	.14¼	.11¾	.13¾
E ....lb.	.06¾	.07¼	.06¾	.07¼	.07	.07¼
F ....lb.	.06⅜	.06⅞	.06⅜	.06⅞	.06⅛	.06⅞
Singapore						
No. 1 ....lb.	.16¼	.16⅞	.16¼	.17½	.15⅝	.19
No. 2 ....lb.	.13¾	.14¼	.13¾	.14¼	.10⅝	.14⅞
No. 3 ....lb.	.05¼	.05¾	.05¼	.05¾	.04⅝	.05⅞
Chips ....lb.	...	.09¾	.09¾	.09¾	.08⅞	.09¾
Dust ....lb.	...	.04¾	.04¼	.05⅝	.04¾	.05⅞
Seeds ....lb.	...	.07⅜	.06⅝	.07⅜	.04¾	.07¼
Elemi, cons ....lb.	.09¾	.10¼	.09¾	.10¼	...	...
Ester ....lb.	.07¾	.08¼	.07⅝	.08⅜	.07¼	.08⅜
Gamboge, pipe, cases .....lb.	.58	.59	.58	.59	.55	.65
Powd, bbls ....lb.	.65	.66	.65	.66	.65	.75
Ghatti, sol. bgs ....lb.	.11	.15	.11	.15	.09	.15
Karaya, powd, bbls, xxx..lb.	.24	.25	.24	.25	.23	.25
xx ....lb.	.16	.17	.16	.17	.15	.17
No. 1 ....lb.	.09½	.10	.09½	.10	.08	.10
No. 2 ....lb.	.08½	.09	.08½	.09	.07	.09
Kauri, NY, San Francisco, Brown XXX, cases ....lb.	.60	.60½	.60	.60½	.60	.60½
BX ....lb.	.33	.33½	.33	.33½	.33	.33½
B1 ....lb.	...	.21	.19	.21	.19	.19½
B2 ....lb.	...	.15½	.14½	.15½	.14½	.15
B3 ....lb.	.12	.12½	.12	.12½	.12	.12½
Pale XXX ....lb.	.65	.65½	.65	.65½	.65	.65½
No. 1 ....lb.	.40	.40½	.40	.40½	.40	.40½
No. 2 ....lb.	.22	.22½	.22	.22½	.22	.22½
No. 3 ....lb.	.15	.15½	.15	.15½	.15	.15½
Kino, tins ....lb.	.70	.80	.70	.80	.70	.80
Mastic ....lb.	.57	.58	.56	.60½	.46	.60½
Sandarac, prime quality, 200 lb bgs & 300 lb cks ...lb.	.28	.30	.19½	.30	.26¼	.35½
Senegal, picked bgs ......lb.	.20	.21	.20	.21	.20	.21
Sorts ....lb.	.11½	.12½	.11½	.12½	.09⅜	.12½
Thus, bbls ....280 lbs.	...	11.50	11.00	11.50	10.50	11.00
Strained ....280 lbs.	...	11.50	11.00	11.50	10.50	11.00
Tragacanth, No. 1, cases ....lb.	1.75	1.80	1.20	1.80	1.15	1.30
No. 2 ....lb.	1.65	1.70	1.10	1.70	1.05	1.20
No. 3 ....lb.	1.50	1.55	.95	1.55	.95	1.05
No. 4 ....lb.	1.40	1.45	.85	1.45	.85	.95
No. 5 ....lb.	1.30	1.35	.75	1.35	.75	.85
No. 6, bgs ....lb.	.30	.31	.18	.31	.14	.19
Sorts, bgs ....lb.	.30	.35	.25	.30	.11	.25
Yacca, bgs ....lb.	.03¼	.03¾	.03¼	.03¾	.03¼	.03¾

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Helium, cyl (200 cu. ft.) cyl.	...	25.00	...	25.00	...	25.00
Hematite crystals, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Paste, 500 bbls ....lb.	...	.11	...	.11	...	.11
Hemlock, 25%, 600 lb bbls, wks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
tks ....lb.	...	.02½	...	.02½	...	.02½
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70°C. Group 3, tks ....gal.	...	.12	...	.12	...	.14
Hexamethylenetetramine, drs ....lb.	.37	.39	.37	.39	.37	.39
Hexyl Acetate, delv, drs ..lb.	.12	.12½	.12	.12½	.12	.12½
tks ....lb.	...	.11½	...	.11½	...	.11½
Hoof Meal, f.o.b. Chicago unit	...	3.00	2.35	3.00	2.50	2.70
Hydrogen Peroxide, 100 vol, 140 lb cbys ....lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride ....lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.17	.20	.17	.20	.17	.20
Indigo, Madras, bbls .....lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drs ....lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ....lb.	.13	.14	.13	.14	...	.12
Iodine, Resublimed, kgs...lb.	1.50	1.55	1.50	1.75	...	1.90
Irish Moss, ord, bales ....lb.	.09	.10	.09	.10	.09	.10
Bleached, prime, bales ..lb.	.18	.19	.18	.19	.18	.19
Iron Acetate Liq. 17°, bbls lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls ..100 lb.	2.75	3.25	2.75	3.25	2.75	3.25
Oxide, English ....lb.	.07½	08¾	.07½	.08¾	.07½	.08¾
Isobutyl Carbinol (128-132°C) drs, wks ....lb.	.33	.34	.33	.34	.33	.34
tks, wks ....lb.	...	.32	...	.32	...	.32
Isopropyl Acetate, tks, frt allowed ....lb.	...	.06	.06	.07½	...	.07½
drs, frt allowed ....lb.	.07	.07½	.07	.09	.08½	.09
Ether, see Ether, isopropyl.						
Keiselguhr, 95 lb bgs, NY, Brown ....ton	60.00	70.00	60.00	70.00	60.00	70.00
Lead Acetate, brown, broken, f.o.b. NY, bbls ......lb.	...	.09½	...	.09½	...	.09½
White, broken, bbls ..lb.	...	.11	...	.11	...	.11
cryst, bbls ....lb.	...	.10½	...	.10½	...	.10½
gran, bbls ....lb.	...	.11	...	.11	...	.11
powd, bbls ....lb.	...	.11¼	...	.11¼	...	.11¼
Arsenate, East, jobbers, drs ....lb.	.09	.09⅜	.09	.09⅜	.09	.09½
Dealers, drs ....lb.	.09¼	.10¾	.09¼	.10¾	.09¼	.10¾
West, jobbers, drs .....lb.	...	.09	...	.09	...	.09
dealers, drs ....lb.	...	.10	...	.10	...	.10
Linoleate, solid, bbls ...lb.	.26	.26½	.26	.26½	.26	.26½
Metal, c-l, NY .....100 lb.	...	4.60	4.50	4.60	3.50	4.50
Red, dry, 95% Pb_2O_4, delv ....lb.	.0735	...	.07	.08	.06	.08
97% Pb_2O_4, delv .....lb.	.0760	...	.07¼	.08¼	.06¼	.08¼
98% Pb_2O_4, delv .....lb.	...	.0810	.07½	.08½	.06½	.08½
Nitrate, 500 lb bbls, wks lb.	.09	.09½	.09	.09½	.10	.14
Oleate, bbls ....lb.	.15	.16	.15	.16	.15	.16
Resinate, precip, bbls ...lb.	...	.14	...	.14	...	.14
Stearate, bbls ....lb.	.22	.23	.22	.23	.22	.23
White, 500 lb bbls, wks..lb.	.06½	.07	.06½	.07	.06½	.07
Sulfate, 500 lb bbls, wks lb.	...	.06	...	.06	...	.06
Lime, chemical quicklime, f.o.b., wks, bulk .....ton	7.00	7.25	7.00	7.25	7.00	7.25
Hydrated, f.o.b., wks ..ton	9.00	12.00	8.50	12.00	8.50	12.00
Lime Salts, see Calcium Salts.						
Lime sulfur, dealers, tks..gal.	...	.11	...	.11	.10½	.11
drs ....gal.	.13	.16	.13	.16	.13	.16½
Dry, bgs, jobbers.......lb.	.07¼	.10¼	.07¼	.10¼	...	...
Linseed Meal, bgs ....ton	...	29.50	29.00	30.00	25.50	40.00
Litharge, coml, delv, bbls..lb.	.0610	.07	.06	.07	.05	.07
Lithopone, dom, ordinary, delv, bgs ....lb.	.04½	.04¾	.04½	.04¾	.04½	.04¾
bbls ....lb.	.04¾	.05	.04¾	.05	.04¾	.05
High strength, bgs .....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Titanated, bgs ....lb.	.06	.06¼	.06	.06¼	.06	.06¼
bbls ....lb.	.06¼	.06½	.06¼	,06½	.06¼	.06½
Logwood, 51°, 600 lb bbls lb.	.06½	.10¼	.06½	.10½	.08½	.10½
Solid, 50 lb boxes .....lb.	.13½	.17½	.13½	.17½	.13½	.17½
Sticks ....ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ....lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	60.00	65.00	60.00	65.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Chloride flake, 375 lb drs, c-l, wks ....ton	36.00	39.00	36.00	39.00	36.00	39.00
Magnesium fluosilicate, crys, 400 lb bbls, wks .....lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls ....lb.	...	.42	...	.42	...	.42
Heavy, 250 lb bbls ...lb.	...	.50	...	.50	...	.50
Palmitate, bbls ....lb.	.23	.24	.23	.24	.22	.24
Stearate, bbls ....lb.	.20	.22	.20	.22	.19	.22
Linoleate, lig drs ......lb.	.18	.19	.18	.19	.18	.19
Resinate, fused, bbls ...lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, bbls ....lb.	...	.12	...	.12	...	.12
Manganese Borate, 30%, 200 lb bbls ....lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks ....lb.	.09	.12	.09	.12	.09	.12
Dioxide, tech (peroxide), paper bgs, c-l ....ton	...	47.50	...	47.50	45.00	50.00
Mangrove, 55%, 400 lb bbls lb.	...	.04	...	.04	...	.04
Bark, African ....ton	...	27.00	26.00	27.00	26.00	30.00
Marble Flour, blk ....ton	12.00	13.00	12.00	13.00	12.00	13.00
Mercuric chloride ....lb.	...	.87	.81	.87	.71	.93
Mercury metal ...76 lb. flasks	...	80.00	73.50	80.00	69.00	77.00
Meta-nitro-aniline ....lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ....lb.	1.40	1.55	1.40	1.55	1.40	1.55

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Current

Meta-phenylene-diamine
Orthodichlorobenzene

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Meta-phenylene-diamine 300 lb bbls ....lb.	.80	.84	.80	.84	.80	.84
Peroxide, 100 lb cs .....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Silicofluoride, bbls .....lb.	.09	.10	.09	.10	.09	.10
Stearate, bbls ....lb.	.19	.20	.19	.20	.19	.20
Meta-toluene-diamine, 300 lb bbls ....lb.	.67	.69	.67	.69	.67	.69
Methanol, 95%, frt allowed, drs ....gal. *o*	.37½	.58	.37½	.58	.37½	.58
tks, frt allowed ....gal. *o*	.33	.36½	.33	.36½	.33	.36½
97% frt allowed, drs gal. *o*	.38½	.59	.38½	.59	.38½	.59
tks, frt allowed ....gal. *o*	.34	.37½	.34	.37½	.34	.37½
Pure, frt allowed, drs gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Synthetic, frt allowed, drs ....gal. *o*	.40	.61	.40	.61	.40	.61
tks, frt allowed ....gal. *o*	.35½	.39	.35½	.39	.35½	.39
Methyl Acetate, dom, 98-100%, drs ....lb.	.16	.17½	.11	.18½	.18	.18½
Synthetic, 410 lb drs ...lb.	.16	.17	.16	.17	.16	.17
tks ....lb.	...	.15	...	.15	...	.15
Acetone, frt allowed, drs ....gal. *p*	.52½	.68½	.48½	.68½	.49½	.73½
tks, frt allowed, drs gal. *p*	...	.48	.44	.48	.44	.52½
Synthetic, frt allowed, east of Rocky M., drs gal. *p*	.57½	.60	.57½	.60	.57½	.60
tks, frt allowed....gal.	...	.53	...	.53	...	.53
West of Rocky M., frt allowed, drs ....gal. *p*	.66	.69	.66	.69	.66	.69
tks, frt allowed ..gal. *p*	...	.63½	...	.63½	...	.63½
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Anthraquinone ....lb.	.65	.67	.65	.67	.65	.67
Butyl Ketone, tks ......lb.	...	.10½	...	.10½	...	.10½
Chloride, 90 lb cyl .....lb.	...	.45	...	.45	...	.45
Ethyl Ketone, tks ......lb.	...	.07½	...	.07½	...	.07½
Propyl carbinol, drs ....lb.	.60	.75	.60	.75	.60	.75
Mica, dry grd, bgs, wks ..lb.	35.00	...	35.00	...	35.00	...
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Molasses, blackstrap, tks, f.o.b. NY ....gal.	.08	.08¼	.08	.08¼	.07¾	.08¼
Monoamylamine, drs, wks lb.	...	1.00	...	1.00	...	1.00
Monochlorobenzene, see Chlorobenzene, mono.						
Monoethanolamine, tks, wks lb.	...	.30	...	.30	...	...
Monomethylparaminosulfate, 100 lb drs ....lb.	3.75	4.00	3.75	4.00	3.75	4.00
Myrobalans 25%, liq bbls..lb.	...	.04¼	...	.04¼	...	.04¼
50% Solid, 50 lb boxes lb.	.06	.06¼	.06	.06¼	.06	.06¼
J1 bgs ....ton	...	23.00	22.75	24.00	23.50	27.00
J2 bgs ....ton	...	15.00	14.50	15.00	15.00	15.75
R2 bgs ....ton	...	14.50	14.00	14.50	16.00	16.50
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ....gal.	...	.31	...	.31	.26	.30
drs, c-l ....gal.	...	.36	...	.36	.31	.35
Naphthalene, dom, crude, bgs, wks ....lb.	...	2.75	2.75	4.50	1.65	3.00
Imported, cif, bgs ....lb.	...	nom.	...	...	1.90	3.00
Dyestuffs, bgs, bbls, Eastern wks ....lb.	.06	.07	.06	.07	.04¼	.07
Balls, flakes, pks ......lb.	...	.08	.07¼	.08	...	...
Balls, ref'd, bbls, Eastern wks ....lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Flakes, ref'd, bbls, Eastern wks ....lb.	...	.07¼	.06¾	.07¼	.04½	.06¾
Dyestuffs, bgs, bbls, Mid-West wks ....lb. *q*	.06½	.07½	.06½	.07½	.04¾	.07½
Balls, ref'd, bbls, Mid-West wks ....lb. *q*	...	.07¾	.07¼	.07¾	.05	.07½
Flakes, ref'd, bbls, Mid-West wks ....lb. *q*	...	.07¾	.07¼	.07¾	.05	.07¼
Nickel Carbonate, bbls....lb.	...	.36	...	.36	.35	.36
Chloride, bbls ....lb.	.18	.19	.18	.19	.18	.19
Oxide, 100 lb kgs, NY..lb	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY ...lb.	.13	.13½	.13	.13½	.12½	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.11½	.13½
Metal ingot ....lb.	...	.35	...	.35	...	.35
Nicotine, free 50%, 8 lb tins, cases ....lb.	8.25	10.15	8.25	10.15	8.25	10.15
Sulfate, 55 lb drs ......lb.	.75	1.17	.75	1.17	.67	.80
Nitre Cake, blk ....ton	12.00	14.00	12.00	14.00	12.00	14.00
Nitrobenzene, redistilled, 1000 lb drs, wks ....lb.	.09	.11	.09	.11	.09	.11
tks ....lb.	...	.08½	...	.08½	...	.08½
Nitrocellulose, c-l-l c-l, wks lb.	.26	.29	.26	.34	.27	.34
Nitrogenous Mat'l, bgs, imp unit	...	2.75	2.00	2.75	2.20	2.75
dom, Eastern wks ....unit	2.75	2.85	1.90	2.85	2.20	2.40
dom, Western wks ....unit	...	nom.	1.85	2.10	1.90	2.30
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Aleppy, bgs .....lb.	.16	.18	.16	.18	.12	.18
Chinese, bgs ....lb.	.19	.20	.19	.20	.19	.20
Oak Bark Extract, 25%, bbls lb.	...	.03½	...	.03½	...	.03½
tks ....lb.	...	.02¾	...	.02¾	...	.02¾
Octyl Acetate, tks, wks ...lb.	...	.15	...	.15	...	...
Orange-Mineral, 1100 lb cks NY ....lb.	.10	.10½	.10	.10½	.09¼	.10½
Orthoaminophenol, 50 lb kgs.lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.82	.84	.82	.84	.82	.84
Orthochlorophenol, drs ....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drs ....lb.	.13	.15	.13	.15	.13	.15
Orthodichlorobenzene, 1000 lb drs ....lb.	.06½	.11½	.05½	.11½	.05½	.06

o Country is divided in 5 zones, prices varying by zone. In drum prices range covers both zone and c-l and lcl quantities in the 5 zones; in each case, bbl. prices are 2½c higher; synthetic is not shipped in bbls.; *p* Country is divided into 5 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila. or N. Y.

	Current	Market	1936 Low	1936 High	1935 Low	1935 High
Orthonitrochlorobenzene, 1200 lb drs, wks ....lb.	.28	.29	.28	.29	.28	.29
Orthonitrotoluene, 1000 lb drs, wks ....lb.	.07	.10	.07	.10	.05½	.10
Orthonitrophenol, 350 lb drs ....lb.	.52	.80	.52	.80	.52	.80
Orthotoluidine, 350 lb bbls, l-c-l ....lb.	.14½	.15	.14½	.15	.14½	.15
Orthonitroparachlorphenol, tins ....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, cryst .....lb.	.17	.25	.17	.25	.17	.25
51 deg liquid ....lb.	.07	.07¾	.07	.07¾	.07	.07¾
Powd, 100 lb bgs ......lb.	.14½	.15	.14½	.15	.14½	.15
Paraffin, rfd, 200 lb cs slabs						
122-127 deg M P ......lb.	.0445	.04½	.0445	.04½	.04	.04¾
128-132 deg M P ......lb.	.04¾	.049	.04¾	.049	.05	.0515
133-137 deg M P ......lb.	.05½	.05¾	.05½	.05¾	.0575	.06
Para aldehyde, 110-55 gal drs ....lb.	.16	.18	.16	.18	.16	.18
Aminoacetanilid, 100 lb kgs ....lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs ......lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drs ..lb.	...	...	...	...	...	...
Cymene, refd, 110 gal dr ....gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks ....lb.	.16	.20	.16	.20	.16	.20
Formaldehyde, bbls, wks lb.	.38	.39	.38	.39	.38	.39
Nitroacetanilid, 300 lb bbls ....lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ....lb.	.47	.51	.47	.51	.48	.55
Nitrochlorobenzene, 1200 lb drs, wks ....lb.	.23½	.24	.23½	.24	.23½	.24
Nitro-orthotoluidine, 300 lb bbls ....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb bbls ....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.36	.37	.36	.37	.35	.37
Phenylenedamine, 350 lb bbls ....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Para Tertiary amyl phenol, wks, drs ....lb.	.32	.50	.32	.50	.32	.50
Toluenesulfonamide, 175 lb bbls ....lb.	.70	.75	.70	.75	.70	.75
tks, wks ....lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ....lb.	.58	.60	.58	.60	.56	.60
Paris Green, Arsenic Basis						
100 lb kgs ....lb.	...	.24	...	.24	...	.24
250 lb kgs ....lb.	...	.22	...	.22	...	.22
Perchlorethylene, 50 gal drs ....lb.	...	.15	...	.15	...	.15
Persian Berry Ext, bbls ..lb.	.55	Nom.	.55	Nom.	.55	Nom.
Pentane, normal, 28-38°C, group 3, tks..........gal.	...	.09	...	.09	...	.09
drs, group 3 ....gal.	.10	.15	.10	.15	.10	.15
Petrolatum, dark amber, bbls ....lb.	.02⅝	.02⅞	.02⅝	.02⅞	.02	.02⅞
Light, bbls ....lb.	.03⅛	.03⅜	.03⅛	.03⅜	.02½	.03⅜
Medium, bbls ....lb.	.02⅞	.03⅛	.02⅞	.03⅛	.02¼	.03⅛
Dark green, bbls ....lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
White, lily, bbls ....lb.	.06	.06¼	.06	.06¼	.05¼	.06½
White, snow, bbls ......lb.	.07	.07¼	.07	.07¼	.06¼	.07½
Red, bbls ....lb.	.02⅝	.02⅛	.02⅝	.02⅛	.02¼	.02⅞
Petroleum Ether, 30-60°, group 3, tks ....gal.	...	.13	...	.13	...	.13
drs, group 3 ....gal.	.15	.16	.15	.16	.15	.16

PETROLEUM SOLVENTS AND DILUENTS

	Current	Market	1936 Low	1936 High	1935 Low	1935 High
Cleaners naphthas, group 3, tks, wks ....gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Bayonne, tks, wks ..gal.	...	.09½	.09	.09½	...	.09
West Coast, tks ....gal.	...	.15	...	.15	...	.15
Hydrogenated, naphthas, frt allowed East, tks ....gal.	...	.16	.15	.16	.15	.17½
No. 2, tks ....gal.	...	.18	...	.18	.18	.22½
No. 3, tks ....gal.	...	.15	...	.15	.15	.17½
No. 4, tks ....gal.	...	.18	...	.18	.18	.22½
Lacquer diluents, tks Bayonne ....gal.	.12	.12½	.12	.12½	.12	.12½
Group 3, tks ....gal.	.08⅜	.08½	.08⅜	.08½	.07⅞	.08
Naphtha, V.M.P., East, tks, wks ....gal.	...	.10	.09	.10	...	.09
Group 3, tks, wks ...gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Petroleum thinner, East, tks, wks ....gal.	...	.09	.09	.09½	...	.09
Group 3, tks, wks ...gal.	.06⅜	.06⅝	.06⅜	.06⅝	.05⅞	.06¼
Rubber Solvents, stand grd, East, tks, wks ......gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks ..gal.	.07⅜	.07½	.07⅜	.07½	.06⅞	.07¼
Stoddard Solvent, East, tks, wks ....gal.	...	.09½	.09	.09½	...	.09
Group 3, tks, wks ...gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Phenol, 250-100 lb drs ....lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine, 100 lb kgs ....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.16	...	.16	...	.16
Phenylhydrazine Hydrochloride ....lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins ....lb.	20.00	22.00	20.00	22.00	20.00	22.00

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ....ton	...	1.85	...	1.85	1.85	3.40
70% basis ....ton	...	2.35	...	2.35	2.35	3.90
72% basis ....ton	...	2.85	...	2.85	2.85	4.40
75-74% basis ....ton	...	3.85	...	3.85	3.85	5.40
75% basis ....ton	...	4.35	...	4.35	4.35	5.50
Tennessee, 72% basis ..ton	...	4.50	...	4.50	4.50	4.75
Phosphorous Oxychloride 175 lb cyl ....lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases ......lb.	.44	.45	.44	.45	.44	.45
Yellow, 110 lb cs, wks..lb.	.28	.33	.28	.33	.28	.33
Sesquisulfide, 100 lb cs..lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl ....lb.	.16	.20	.16	.20	.16	.20
Phthalic Anhydride, 100 lb drs, wks ....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls						
Destructive dist ....lb.	.44	.46	.44	.46	.44	.50
Steam dist wat wh bbls gal.	.64	.65	.64	.65	.64	.65
tks ....gal.	...	.59	...	.59	...	.59
Straw color, bbls ......gal.	...	.59	...	.59	...	.59
tks ....gal.	...	.54	...	.54	...	.54
Pitch Hardwood, wks ....ton	...	15.00	...	15.00	15.00	20.00
Burgundy, dom, bbls, wks ....lb.	...	.03½	...	.03½	...	.03½
Imported ....lb.	.11	.13	.11	.13	.11	.13
Coaltar, bbls, wks .....ton	...	19.00	...	19.00	...	19.00
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls ....bbl.	4.00	4.50	4.00	4.50	3.75	4.25
Stearin, drs ....lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, refd ....oz.	...	63.00	34.50	63.00	35.00	38.00

POTASH

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Potash, Caustic, wks, sol..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake ....lb.	.07	.07⅜	.07	.07⅜	.07	.07⅜
Liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, imported						
20% basis, blk ....ton	...	12.00	11.00	12.00	8.60	11.00
30% basis, blk ....ton	...	16.50	14.40	16.50	12.90	14.40
Potassium Acetate ....lb.	.26	.28	.26	.28	.26	.28
Potassium Muriate, 80% basis bgs ....ton	...	25.00	22.50	25.00	22.00	22.50
Dom, blk ....unit	...	.50	.45	.50	.40	.45
Pot & Mag Sulfate, 48% basis bgs ....ton	...	24.75	22.25	24.75	19.50	22.50
Potassium Sulfate, 90% basis bgs ....ton	...	36.25	33.75	36.25	33.75	35.00
Potassium Bicarbonate, USP 320 lb bbls ....lb.	.09	.18	.09	.18	.07½	.09
Bichromate Crystals, 725 lb cks ....lb.	.08½	.09	.08½	.09	.08⅛	.09
Binoxalate, 300 lb bbls..lb.	...	.23	...	.23	.22	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.35	.36
Carbonate, 80-85% calc 800 lb cks ....lb.	.07¼	.07½	.07¼	.07½	.07½	.07⅞
liquid, tks ....lb.	...	.02⅞	...	.02⅞	...	...
drs, wks ....lb.	.03⅛	.03¼	.03⅛	.03¼	...	...
Chlorate crys, 112 lb kgs, wks ....lb.	.09¼	.09½	.09¼	.09½	...	.09¾
gran, kgs ....lb.	.12	.13	.12	.13	.12	.13
powd, kgs ....lb.	.08	.08¼	.08	.08¼	.08¾	.09¾
Chloride, crys, bbls ....lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs ....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb cases ..lb.	.55	.57½	.55	.57½	.55	.57½
Iodide, 75 lb bbls ......lb.	1.10	1.15	1.10	1.25	1.25	1.40
Metabisulfite, 300 lb bbls ....lb.	...	.15	...	.15	...	.15
Oxalate, bbls ....lb.	.25	.26	.25	.26	.16	.24
Perchlorate, cks, wks ...lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, 112 lb kgs ....lb.	.35	.38½	.35	.38½	.35	.38½
Yellow, 500 lb casks...lb.	.18	.19	.18	.19	.18	.19
Tartrate Neut, 100 lb kgs ....lb.	...	.21	...	.21	...	.21
Titanium Oxalate, 200 lb bbls ....lb.	.32	.35	.32	.35	.32	.35
Propane, group 3, tks ....lb.	...	.03	...	.03	...	.07
Pumice Stone, lump bgs ..lb.	.04½	.06	.04½	.06	.04½	.06
250 lb bbls ....lb.	.05	.07	.05	.07	.05	.07
Powd, 350 lb bgs ......lb.	.02½	.03	.02½	.03	.02½	.03
Putty, coml, tubs .....100 lb.	...	2.75	...	2.75	...	2.75
Linseed Oil, kgs ...100 lb.	...	4.50	...	4.50	...	4.50
Pyridine, 50 gal drs .....gal.	...	1.30	...	1.30	1.20	1.30
Pyrites, Spanish cif Atlantic ports, blk ....unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins ....lb.	2.40	2.75	2.40	2.75	2.40	3.00
Quebracho, 35% liq tks ...lb.	...	.02⅝	...	.02⅝	...	.02⅝
450 lb bbls, c-l ....lb.	...	.03½	.03⅛	.03½	...	.03⅛
Solid, 63%, 100 lb bales cif ....lb.	...	.03⅝	...	.03⅝	...	.03⅝
Clarified, 64%, bales..lb.	...	.03⅞	...	.03⅞	...	.03⅞
Quercitron, 51 deg liq, 450 lb bbls ....lb.	.06	.06½	.06	.06½	.06	.06½
Solid, 100 lb boxes .....lb.	.10	.12	.10	.12	.10	.12
R Salt, 250 lb bbls, wks ..lb.	.52	.57	.52	.57	.44	.45
Resorcinol tech, cans .....lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst ......lb.	.14	.14½	.14	.14½	.14	.15
Powd, bbls ....lb.	.13	.13½	.13	.13½	.13	.13½
Rosin Oil, bbls, first run gal.	.45	.47	.38	.46	.36	.45
Second run ....gal.	.46	.48	.43	.51	.43	.48
Third run, drs ....gal.	.47	.49	.49	.57	.50	.60

Rosins
Sodium Nitrate

Prices

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:						
B	...	7.15	4.45	7.15	4.65	5.65
D	...	7.15	4.95	7.15	5.02½	5.75
E	...	7.30	5.15	7.30	5.15	5.90
F	...	7.30	5.40	7.30	5.20	5.95
G	...	7.30	5.50	7.30	5.25	6.00
H	...	7.30	5.55	7.30	5.25	6.00
I	...	7.30	5.60	7.30	5.25	6.00
K	...	7.30	5.70	7.30	5.27½	6.05
M	...	7.30	5.60	7.30	5.35	6.10
N	...	7.35	5.70	7.35	5.75	6.40
WG	...	7.70	5.85	7.70	5.95	6.87½
WW	...	8.45	5.90	8.45	6.25	7.55
Rosins, Gum, Savannah (280 lb unit):						
B	...	5.90	3.15	5.90	3.40	4.40
D	...	5.90	3.75	5.90	3.70	4.50
E	...	6.05	3.90	6.05	3.90	4.65
F	...	6.05	4.10	6.05	3.95	4.70
G	...	6.05	4.20	6.05	4.00	4.75
H	...	6.05	4.30	6.05	4.00	4.75
I	...	6.05	4.30	6.05	4.00	4.75
K	...	6.05	4.35	6.05	4.02½	4.80
M	...	6.05	4.35	6.05	4.10	4.85
N	...	6.10	4.45	6.10	4.50	5.15
WG	...	6.45	4.45	6.45	4.70	5.60
WW	...	7.20	4.55	7.20	5.15	6.25
X	...	7.20	4.55	7.20	5.20	6.25
Rosins, Wood, wks (280 lb unit), wks, FF	...	...	6.15	6.15	4.05	6.35
I	...	...	6.40	6.40	4.30	7.00
M	...	...	6.60	6.60	4.55	7.25
N	...	...	7.10	7.10	5.00	7.75
Rosin, Wood. c-l, FF grade, NY	...	6.87	6.10	7.35	4.92	5.62
Rotten Stone, bgs mines..ton	...	35.00	...	35.00	23.50	35.00
Lump, imported, bbls ...lb.	.05	.07	.05	.07	.05	.07
Selected, bbls. ....lb.	.08	.10	.08	.10	.08	.10
Powdered, bbls ....lb.	.02½	.05	.02½	.05	.02½	.05
Sago Flour, 150 lb bgs ....lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Sal Soda, bbls, wks ...100 lb.	...	1.15	1.15	1.30	...	1.30
Salt Cake, 94-96%, c-l, wks ton	19.00	23.00	19.00	23.00	13.00	18.00
Chrome, c-l, wks ......ton	11.00	12.00	11.00	13.00	12.00	13.00
Saltpetre, double refd, gran, 450-500 lb bbls ......lb.	.059	.06¼	.059	.06¼	.059	.06¼
Powd, bbls ....lb.	.069	.07⅞	.069	.07⅞	.069	.07⅞
Cryst, bbls ....lb.	.069	.08	.069	.08	.069	.08
Satin, White, 550 lb bbls..lb.	...	.01½	...	.01½	...	.01½
Shellac, Bone dry, bbls..lb. r	.18	.19	.18	.26½	.19	.32
Garnet, bgs ....lb.	.16	.17	.16	.20	.17	.27
Superfine, bgs ....lb. s	.15½	.17	.15½	.18	.16	.28
T. N., bgs ....lb. s	.14½	.15½	.14	.16	.13	.25
Schaeffer's Salt, kgs .....lb.	.48	.50	.48	.50	.48	.50
Silver Nitrate, vials .....oz.	...	.32⅝	.32 5/16	.32⅝	.36⅜	.53¾
Slate Flour, bgs, wks ....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks ....100 lb.	...	1.25	...	1.25	...	1.25
58% light, bgs .....100 lb.	...	1.23	...	1.23	...	1.23
blk ....100 lb.	...	1.05	...	1.05	...	1.05
paper bgs ....100 lb.	...	1.20	...	1.20	...	1.20
bbls ....100 lb.	...	1.50	...	1.50	...	1.50
Soda Caustic, 76% grnd & flake, drs ....100 lb.	...	3.00	...	3.00	...	3.00
76% solid, drs .....100 lb.	...	2.60	...	2.60	...	2.60
Liquid sellers, tks, 100 lbs.	...	2.25	...	2.25	...	2.25
Sodium Abietate, drs .....lb.	...	.08	...	.08	...	.08
Acetate, tech, 450 lb bbls, wks ....lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs ....lb.	...	.64	...	.64	...	.64
Antimoniate, bbls ......lb.	.12	.12½	.12	.14	...	...
Arsenate, drs ....lb.	...	.10½	...	.10½	...	.10½
Arsenite, liq, drs .....gal.	.40	.75	.40	.75	.40	.75
Benzoate, USP, kgs ....lb.	.46	.48	.46	.48	.46	.48
Bicarb, 400 lb bbl, wks 100 lb.	...	1.85	...	1.85	...	1.85
Bichromate, 500 lb cks, wks ....lb.	.06½	.07	.06½	.07	.06⅛	.07
Bisulfite, 500 lb bbl, wks lb.	.03¼	.036	.03¼	.036	.03¼	.036
35-40% sol cbys, wks 100 lb.	1.95	2.10	1.95	2.10	1.95	2.10
Chlorate, bgs, wks .....lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Chloride, tech ....ton	13.60	16.50	13.60	16.50	13.60	16.50
Cyanide, 96-98%, 100 & 250 lb drs, wks ......lb.	.15½	.17½	.15½	.17½	.15½	.17½
Fluoride, 90%, 300 lb bbls, wks ....lb.	.07½	.08¼	.07¼	.08¼	.07¼	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks ....lb.	.17	.18	.17	.19	.18	.21
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	2.50	3.00	2.50	3.00	2.50	3.00
Tech, reg cryst, 375 lb bbls, wks ......100 lb.	2.40	2.75	2.40	2.75	2.40	2.75
Iodide ....lb.	1.90	1.95	1.90	2.05	2.00	2.40
Metanilate, 150 lb bbls..lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks ....100 lb.	2.30	3.00	2.30	3.00	2.65	3.05
cryst, bbls, wks ..100 lb.	...	2.90	2.90	3.25	...	3.25
Monohydrate, bbls .....lb.	...	.023	...	.023	...	.02½
Napthenate, drs ....lb.	...	.09	...	.09	...	.09
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY ....ton	...	25.80	24.80	25.80	...	24.80
100 lb bgs ....ton	...	26.50	25.50	26.50	...	25.50
Bulk ....ton	...	24.50	23.50	24.50	...	23.50

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 3c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y.

Current — Sodium Nitrite / Thiocarbanilid

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Sodium (continued):						
Nitrite, 500 lb bbls .....lb.	.0710	.08	.0710	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls, wks..lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls ..lb.	.17	.18	.17	.18	.17	.19
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.10	2.10	2.30	2.20	2.30
bgs, wks ....100 lb.	...	1.90	1.90	2.10	2.00	2.10
tri-sodium, tech, 325 lb bbls, delv ......100 lb.	...	2.20	2.20	2.30	2.30	2.70
bgs, delv ......100 lb.	...	2.00	2.00	2.10	2.10	2.60
Picramate, 160 lb kgs ..lb.	.67	.69	.67	.69	.67	.69
Prussiate, Yellow, 350 lb bbl, wks ....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, anhyd, 100 lb bbls ....lb.	.102	.132	.102	.132	.102	.15
Silicate, 60°, 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 35 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks ....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY ....lb.	.07	.07¼	.05¼	.07¼	.04¼	.05
Stannate, 100 lb drs ....lb.	.28½	.29	.28½	.34	.31	.38
Stearate, bbls ....lb.	.22	.26	.21	.26	.20	.25
Sulfanilate, 400 lb bbls..lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-l, wks ....100 lb. ‡	1.30	1.55	1.30	1.55	1.25	2.35
Sulfide, 80% cryst, 440 lb bbls, wks ....lb.	...	.02¼	...	.02¼	...	.02¼
62% solid, 650 lb drs, c-l, wks ....lb.	...	.03	...	.03	...	.03
Sulfite, cryst, 400 lb bbls, wks ....lb.	.023	.02½	.023	.02½	.023	.02½
Sulfocyanide, bbls ......lb.	.28	.47	.28	.47	.32	.42½
Tungstate, tech, crys, kgs lb.	.85	.90	.85	.90	...	.90
Spruce Extract, ord, tks...lb.	...	.01	...	.01	...	.01
Ordinary, bbls ....lb.	...	.01½	...	.01½	...	.01½
Super spruce ext, tks....lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, bbls...lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext, powd, bgs ....lb.	...	.04	...	.04	...	.04
Starch, Pearl, 140 lb bgs ....100 lb.	4.04	4.15	2.99	4.30	3.13	3.78
Powd, 140 lb bgs....100 lb.	4.16	4.36	3.09	4.54	3.23	3.66
Potato, 200 lb bgs......lb.	.04½	.05½	.04½	.05½	.04½	.06
Imp, bgs ....lb.	.05¾	.06	.05¾	.06	.05¾	.06½
Rice, 200 lb bbls ....lb.	...	.07¼	...	.07¼	.07¼	.08½
Wheat, thick, bgs ......lb.	...	.08¼	...	.08¼	...	.08¼
Strontium carbonate, 600 lb bbls, wks ....lb.	.07¼	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls, NY lb.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Sucrose octa-acetate, den, grd, bbls, wks ....lb.	.45	...	.45	...	...	...
tech, bbls, wks ....lb.	.40	...	.40	...	...	...
Sulfur	...	...	...	...	...	...
Crude, f.o.b. mines ....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour, coml, bgs ....100 lb.	1.60	2.35	1.60	2.35	1.60	2.35
bbls ....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs ..100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Superfine, bgs ......100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls ....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs ....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls ....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs ....100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls ....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, red, 700 lb drs, wks ....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs, wks lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl lb.	.06½	.08½	.06½	.08½	.08½	.10
Multiple units, wks ....lb.	.05½	.06	.05½	.06	...	.06½
tks, wks ....lb.	.04½	.04¾	.04½	.04¾	...	.04¾
Refrigeration, cyl, wks ...lb.	.10	.13	.10	.13	...	.13
Multiple units, wks .....lb.	.07	.09¼	.07	.09¼	...	.09¼
Sulfuryl Chloride ....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd ......ton	...	60.00	52.00	60.00	50.00	65.00
dom, bgs, wks ....ton	...	35.00	...	35.00	...	35.00
Superphosphate, 16% bulk, wks ....ton	...	8.00	8.00	8.25	8.25	8.50
Run of pile ....ton	...	7.50	7.50	7.75	7.75	8.00
Talc, Crude, 100 lb bgs, NY ....ton	14.00	15.00	14.00	15.00	14.00	15.00
Refd, 100 lb bgs, NY ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bgs, NY ton	23.00	30.00	22.00	30.00	22.00	30.00
Refd, white, bgs .....ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	70.00	75.00	70.00	75.00	70.00	75.00
Refd, white, bgs, NY ton	75.00	80.00	75.00	80.00	75.00	80.00
Tankage Grd, NY ....unit §	...	4.00	2.65	4.00	2.35	3.00
Ungrd ....unit §	3.00	3.25	2.40	3.25	2.15	2.50
Fert grade, f.o.b. Chicago ....unit §	...	3.50	2.40	3.50	2.25	2.65
South American cif..unit §	...	3.65	2.70	3.65	2.45	3.15
Tapioca Flour, high grade, bgs ....lb.	.03½	.05½	.03½	.05½	.0215	.05
Tar Acid Oil, 15%, drs ..gal.	.22½	.23½	.22½	.23½	.21	.23½
25%, drs ....gal.	.24½	.26½	.24½	.26½	.23	.26½
Tar, pine, delv, drs .....gal.	...	.26	.25	.26	.25	.26
tks, delv ....gal.	...	.20	...	.20	...	.20
Tartar Emetic, tech ......lb.	.24¾	.25	.24¾	.25	.22¾	.25
USP, bbls ....lb.	.28	.28½	.28	.28½	.28	.28½
Terpineol, den grd, drs ...lb.	.13¾	.14¾	.13¾	.14¾	.13¾	.14¾
tks ....lb.	.13	.14	.13	.14	.13	.14
Tetrachlorethane, 50 gal drs lb.	.08	.08½	.08	.08½	.08½	.09
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbl..lb.	.20	.25	.20	.25	.20	.25

‡ Bags 15c lower; § + 10.

	Current Market		1936 Low	1936 High	1935 Low	1935 High
Tin, crystals, 500 lb bbls, wks ....lb.	.34	.34½	.35	.37½	.36	.39½
Metal, NY ....lb.	...	.42⅞	.40½	.48⅞	.456	.52½
Oxide, 300 lb bbls, wks lb.	.47	.49	.47	.53	.51	.58
Tetrachloride, 100 lb drs, wks ....lb.	...	.21¾	.21¼	.24¾	.24¾	.26¾
Titanium Dioxide, 300 lb bbls ....lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.19¼
Barium Pigment, bbls ..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Calcium Pigment, bbls ..lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Toluol, 110 gal drs, wks gal.	...	.35	...	.35	...	.35
8000 gal tks, frt allowed gal.	...	.30	...	.30	...	.30
Toluidine, mixed, 900 lb drs, wks ....lb.	.27	.28	.27	.28	.27	.28
Toner Lithol, red, bbls ....lb.	.75	.80	.75	.80	.75	.80
Para, red, bbls ....lb.	...	.75	...	.75	...	.75
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	.32	.36	.32	.36	.32	.36
Triamylamine, drs, wks ..lb.	...	1.25	...	1.25	...	1.25
Trichlorethylene, drs, frt allowed ....lb.	.089	.094	.089	.094	.09½	.10
Triethanolamine, 50 gal drs wks ....lb.	.26	.30	.26	.30	.26	.38
tks, wks ....lb.	...	.25	...	.25	...	...
Tricresyl Phosphate, drs ..lb.	.23	.26	.19	.26	.21	.23
Triphenyl Guanidine .....lb.	.58	.60	.58	.60	.58	.60
Tripoli, airfloated, bgs, wks ....ton	27.50	30.00	27.50	30.00	27.50	30.00
Tungsten, Wolframite per unit	15.00	15.25	15.00	15.25	15.00	15.25
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.43½	.40½	.50	.43¾	.55¼
Savannah, bbls ....gal.	...	.38½	.35½	.45	.38¾	.50¼
Jacksonville, bbls ......gal.	...	.38½	.35¼	.44½	.38¾	.50¼
Wood Steam dist, bbls, c-l, NY ....gal.	...	.39	.38	.47	.43	.50
Urea, pure, 112 lb cases ..lb.	.14½	.15½	.14½	.17	.15½	.17
Fert grade, bgs. c.i.f. ..ton c.i.f. S.A. points ....ton	95.00	110.00	95.00	110.00	100.00	120.00
Urea, dom, f.o.b., wks....ton	95.00	110.00	95.00	110.00	...	...
Urea Ammonia liq 55% NH_3, tks ....unit	...	...	...	.96	..	.96
Valonia beard, 42%, tannin bgs ....ton	46.00	55.00	46.00	64.50	40.00	58.00
Cups, 32% tannin, bgs..ton	35.00	42.00	35.00	42.00	26.00	49.00
Mixture, bark, bgs .....ton	...	Nom.	...	Nom.	...	32.00
Vanilin, ex eugenol, 100 lb tins ....lb.	...	3.75	...	3.75	...	...
Ex-guaiacol ....lb.	...	3.65	...	3.65	...	...
Vermillion, English, kgs ..lb.	1.52	1.55	1.52	1.79	1.48	1.71
Vinyl Chloride, 16 lb cyl ..lb.	..	1.00		1.00	..	1.00
Wattle Bark, bgs ....ton	29.00	30.00	26.50	30.00	29.00	32.00
Extract, 60°, tks, bbls ..lb.	...	.03⅝	...	.03⅝	...	.03¾
WAXES						
Wax, Bayberry, bgs ......lb.	.17½	.20	.17½	.20	.17½	.23
Bees, bleached, white 500 lb slabs, cases ....lb.	.36	.38	.34	.38	.33½	.34
Yellow, African, bgs..lb.	.24	.25	.24	.26½	.21	.25½
Brazilian, bgs .....lb.	.26½	.28½	.25	.28½	.21½	.26½
Chilean, bgs ....lb.	.26½	.28½	.25	.28½	.21½	.26½
Refined, 500 lb slabs, cases ....lb.	28	.30	.28	.30	.27½	.28
Candelilla, bgs ....lb.	.16	.17½	.14	.17½	.10	.17½
Carnauba, No. 1, yellow, bgs ....lb.	.46	.47½	.43½	.48	.35	.54
No. 2, yellow, bgs ....lb.	.45	.45½	.42	.46	.34	.51
No. 2, N. C., bgs ....lb.	.39	.40	...	.41	.26½	.43½
No. 3, Chalky, bgs ...lb.	.35¼	.36¾	.34	.38	.21	.42½
No. 3, N. C., bgs ....lb.	.35¼	.36¾	.34	.41	.22½	.43
Ceresin, white, imp, bgs lb.	.43	.45	.43	.45	.43	.45
Yellow, bgs ....lb.	.36	.38	.36	.38	.36	.38
Domestic, bgs ....lb.	.08	.11	.08	.11	.08	.11
Japan, 224 lb cases .....lb.	.08¼	.08¾	.08	.08¾	.06	.09
Montan, crude, bgs ....lb.	.10¾	.11¾	.10¾	.11¾	.10½	.11¾
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.23	.24	.22	.24	.19	.24
Cakes, cases ....lb.	.24	.25	.23	.25	.20	.25
Whiting, prec 200 lb bgs, c-l, wks ....ton	...	15.00	...	15.00	12.00	15.00
Alba, bgs, c-l, wks ....ton	...	15.00	...	15.00	...	15.00
Gliders, bgs, c-l, wks ..ton	11.50	14.50	11.50	15.00	...	15.00
Wood Flour, c-l, bgs .....ton	18.00	30.00	18.00	30.00	18.00	30.00
Xylol, frt allowed, East 10° tks, wks ....gal.	...	.33	...	.33	.27	.33
Coml, tks, wks, frt allowed ....gal.	...	.30	...	.30	.26	.30
Xylidine, mixed crude, drs lb.	.36	.37	.36	.37	.36	.37
Zinc, Carbonate tech, bbls, NY ....lb.	.09½	.11	.09½	.11	.09½	.11
Chloride fused, 600 lb drs, wks ....lb.	.04½	.05¾	.04½	.05¾	.04½	.05¾
Gran, 500 lb bbls, wks ..lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks..100 lb.	...	2.00	...	2.00	...	2.00
Cyanade, 100 lb drs ....lb.	.36	.37	.36	.38	.36	.41
Zinc Dust, 500 lb bbls, c-l, delv ....lb.	...	.0755	.068	.0755	.057	.0685
Metal, high grade slabs, c-l, NY ....100 lb.	...	5.225	5.22	5.275	4.05	5.22½
E. St. Louis .....100 lb.	...	4.80	4.80	4.90	3.70	4.85
Oxide, Amer, bgs, wks..lb.	.05	.05½	.05	.05½	.05	.06¼
French, 300 lb bbls, wks ....lb.	.05½	.07	.05½	.07	.05½	.10⅞
Palmitate, bbls ....lb.	.22	.23	.22	.23	.21	.23
Perborate, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Peroxide, 100 lb drs ...lb.	...	1.25	...	1.25	...	1.25
Resinate, fused, dark, bbls ....lb.	.09	.10	.05¾	.10	.05¾	.06½
Stearate, 50 lb bbls ....lb.	.19	.22	.19	.22	.18	.22

Current

Zinc Sulfate
Oil, Whale

	Current Market		1936		1935	
			Low	High	Low	High
Zinc Sulfate, crys, 400 lb bbl, wks ....lb.	.028	.033	.028	.033	.028	.033
Flake, bbls ....lb.	.032	.035	.032	.035	.032	.035
Sulfide, 500 lb bbls, delv lb.	.10¾	.11¾	.10¾	.11¾	.10¾	.11¾
bgs, delv ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Sulfocarbolate, 100 lb kgs ....lb.	.24	.25	.24	.25	.24	.25
Zirconium Oxide, Nat kgs lb.	.02½	.03	.02½	.03	.02½	.03
Pure, kgs ....lb.	.45	.50	.45	.50	.45	.50
Semi-refined, kgs ......lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

Castor, No. 3, 400 lb bbls..lb.	.10¼	.10¾	.10¼	.10¾	.09¾	.10¾
Blown, 400 lb bbls .....lb.	.12¼	.13	.12¼	.13	.11½	.16
China Wood, bbls spot NY lb.	.15	.15¼	.14	.19¼	.094	.40
Tks, spot NY ....lb.	.1450	.1480	.13¾	.19	.088	.35
Coast, tks ....lb.	...	.14¼	.132	.18	.087	.24
Coconut, edible, bbls NY..lb.	...	.10½	.09¼	.10½	.04	.12
Manila, tks, NY ....lb.	...	.05¼	.04⅛	.05¼	.03¾	.06¼
Tks, Pacific Coast ....lb.	.04⅞	.05	.03⅞	.04⅞	.03⅜	.06
Cod, Newfoundland, 50 gal bbls ....gal.	...	.43	.40	.43	.34	.38
Copra, bgs, NY ....lb.	.0315	.0320	.0320	.0290	.02	.038
Corn, crude, tks, mills ....lb.	...	.09¾	.08	.09¾	.08¾	.11
Refd, 375 lb bbls, NY ..lb.	.12½	.13	.10¾	.13	.11½	.14
Cottonseed, see Oils and Fats News Section.						
Degras, American, 50 gal bbls. NY ....lb.	.05½	.06	.05¼	.06¾	.04½	.06
English, bbls, NY......lb.	.09	.09½	.08¾	.10¼	.04¾	.06½
Greases, Yellow ....lb.	...	.05⅝	.03⅜	.05⅝	.05	.06¾
White, choice bbls, NY lb,	.06⅜	.08⅜	.04⅛	.08⅜	.05¼	.08½
Herring, Coast, tks ......gal.	...	.31	...	.31	.23	.33
Lard Oil, edible, prime ...lb.	...	.14¼	.12¾	.14½	.09¾	.20½
Extra, bbls ....lb.	...	.10¾	.09½	.11	.08½	.11¾
Extra, No. 1, bbls ......lb.	...	.09¾	.07¾	.09¾	.08¼	.11
Linseed, Raw, less than 5 bbl lots ....lb.	...	.117	.102	.109	.091	.1130
bbls, c-l, spot ....lb.	...	.1030	.092	.1030	.083	.102
Tks ....lb.	...	.097	.086	.097	.0770	.096
Menhaden, tks, Baltimore gal.	...	.27	.25	.36	.25	.36
Refined, alkali, drs .....lb.	...	.074	.066	.082	.061	.082
Tks ....lb.	...	.068	.062	.072	.055	.072
Light pressed, drs ......lb.	...	.068	.06	.076	.055	.076
Tks ....lb.	...	.062	.056	.066	.049	.066
Kettle bodied, drs .....lb.	...	.084	.08	.096	...	...
Neatsfoot, CT, 20° bbls, NY ....lb.	.16	.16¼	.16	.16¾	.16¼	.16¾
Extra, bbls, NY ....lb.	...	.10	.08	.09½	.08½	.11¼
Pure, bbls, NY ....lb.	...	.11½	.11½	.12¾	.11¾	.13¼
Oiticica, bbls ....lb.	.11	.12¾	.11	.15½	.13½	.28
Oleo, No. 1, bbls, NY ....lb.	...	.11	.09¼	.12½	.10¾	.14½
No. 2, bbls, NY ....lb.	...	.10½	.08¾	.12	.10	.13¾
Olive, denat, bbls, NY ...gal.	...	1.50	.73	1.50	.82	.95
Edible, bbls, NY ......gal.	2.25	nom.	1.60	2.25	1.55	1.90
Foots, bbls, NY ....lb.	.09⅜	.09½	.08	.09½	.07⅛	.10
Palm, Kernel, bulk ....lb.	...	.05	.04¾	.05	...	...
Niger, cks ....lb.	.0475	.05	.04	.05	.034	.05¾
Sumatra, tks ....lb.	.0450	.05⅜	.03¾	.05⅜	...	...
Peanut, crude, bbls, NY ..lb.	...	.09½	.08	.09½	...	...
Tks, f.o.b. mill ....lb.	...	.09¼	.07¾	.09¼	.08¾	.10¾
Refined, bbls, NY ......lb.	...	.12½	.12	.13¼	.12½	.14
Perilla, drs, NY ....lb.	.09¾	.10	.07	.10	.07¼	.10¼
Tks, Coast ....lb.	.09¼	.09⅜	.066	.09⅜	.068	.08½
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.11¼	.12	.086	.12	.07½	.09
Denatured, drs, NY ...gal.	.65	.66	.52	.66	.40	.56
Red, Distilled, bbls ....lb.	.09⅝	.10⅝	.08⅝	.10⅝	.07⅜	.10⅝
Tks ....lb.	...	.08¾	.07¾	.08¾	.06½	.08¾
Salmon, Coast, 8000 gal tks ....gal.	...	.32	.31	.32½	.25	.35
Sardine, Pac Coast, tks ..gal.	.32	nom.	.28	.39	.24½	.37½
Refined alkali, drs ......lb.	.074	.075	.066	.082	.065	.082
Tks ....lb.	...	.068	.062	.072	.06	.072
Light pressed, drs ......lb.	...	.068	.06	.076	.055	.076
Tks ....lb.	...	.062	.056	.066	.049	.066
Sesame, yellow, dom .....lb.	...	.14	.12¾	.14½	.12¼	.15½
White, dos ....lb.	.14	.14½	.12¾	.14½	.12¾	.15½
Soy Bean, crude						
Dom, tks, f.o.b. mills ...lb.	...	.087	.07	.087	.08	.10
Crude, drs, NY ......lb.	.093	.099	.076	.099	.086	.11
Refd, bbls, NY ....lb.	.098	.107	.081	.107	.091	.115
Tks ....lb.	.092	.097	.07½	.097	.08	.10½
Sperm, 38° CT, bleached, bbls NY ....lb.	.094	.096	.094	.101	.099	.101
45° CT, bleached, bbls, NY ....lb.	.087	.089	.087	.094	.092	.094
Stearic Acid, double pressed dist bgs ....lb.	.10	.11	.08½	.11	.10	.12¼
Double pressed saponified bgs ....lb.	.10½	.11½	.09	.11½	.09	.12¾
Triple pressed dist bgs..lb.	.12¾	.13¾	.11¼	.13¾	.12¾	.15¼
Stearine, Oleo, bbls ......lb.	.10	.10½	.07¼	.10½	.09¼	.12½
Tallow City, extra loose ..lb.	...	.06⅝	.04⅛	.06⅝	.05⅜	.07⅜
Edible, tierces ....lb.	...	.08¾	.06¾	.08¾	.07¼	.09¼
Acidless, tks, NY ......lb.	...	.09¼	.07	.09¼	.07½	.10¾
Turkey Red, single, bbls ..lb.	.08	.08½	.08	.08½	.07½	.08½
Double, bbls ....lb.	.12½	.13	.12½	.13½	.12½	.13½
Whale:						
Winter bleach, bbls, NY lb.	.072	.077	.072	.081	.07	.083
Refined, nat, bbls, NY ..lb.	.068	.07	.068	.076	.064	.081

THE CHEMICAL MARKET-PLACE

Local Suppliers

A directory of responsible manufacturers' agents and jobbers maintaining spot stocks

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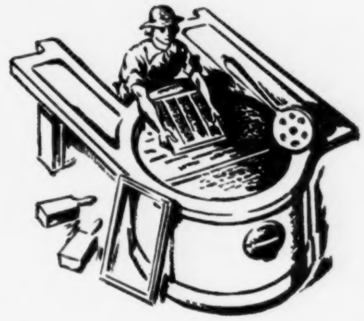

"We"—Editorially Speaking

Twenty-five years ago—November 11, 1911, or "11-11-11"—the first domestic price list of rayon was published. The output that year was 363,000 lbs. Last year it was 260,000,000 lbs. Congratulations on the very solid silver anniversary.

Speaking of anniversaries, we have published the four hundred and sixty-second notice of company booklets in the last issue and handled 8,762 requests for them from subscribers since the first of the year—no, we don't know how many dollars changed hands.

Advancing platinum prices have turned the spotlight on the "imperial metal" and next month's issue will contain an article on it and its allied group of metals by Charles Engelhard, than whom there is no than whomer as an authority.

Do you know why—

Glenn Haskell complains of a "dog nuisance"?

Appendicitis is unpopular in alkali circles?

The Ridgefield, N. J. citizens are chemically-minded?

Add to the complications of the Robinson-Patman bill the fact that the publication of the correct price of chemicals in trade papers renders them liable to conspiracy while an incorrect price lays them open to the charge of illegal deception—and two years ago we were all being urged by N. R. A. high-binders to use published prices as a means of eliminating the well-known chiseler. All three ways can't be right, and somehow we suspect that they are all three wrong!

Last month, August 4th to be exact, marked the 50th anniversary of the first patent granted on a flotation process. A Mrs. Carrie Jane Billings, wife of a Chicago physician who gambled on mining stocks with the usual result, became interested in minerals and having a knowledge of chemistry soon discovered the affinity of oils for mineral particles. Later, when a widow, a fire destroyed her papers, and her patents lapsed.

It's getting to be a dull month when there isn't at least one new liquid chlorine producer.

Fifteen Years Ago

From our issues of September, 1921

George H. Whaley writes series of articles on American dyes for Chicago *Journal of Commerce.*

At $43 ton for sodium nitrate importers declared price lowest in history and forecast advances (present price $24.80).

Dr. Wm. H. Nichols announces successful commercial production of air nitrogen by Allied.

B. T. Bush elected first president Salesmen's Ass'n.

Commercial Solvents opens London office, W. A. Barton, Mgr.

E. D. Winkworth succeeds E. L. Price as president Solvay Process Co.

Iodine Pool formed in Chile.

American Dyes Institute formed with R. C. Jeffcott as first president.

Dr. E. R. Weidlein succeeds Dr. Raymond Bacon as director Mellon Institute.

Wm. S. Gray buys 660 shares of Katzenbach & Bullock common for $11,000.

Dr. C. G. Derick resigns as director research of National Aniline.

Geo. Cooper and Ernest Mercelis defeat Messrs. Bennett and Wies and Dr. Feinberg and Carl Funke in chemical tennis matches.

Badische Oppau ammonia plant explosion kills 1,100.

German Potash Syndicate advances prices 35 per cent.

Salutations and thanks to Duart MacLean for the complimentary clipping he does from our pages for his department in the *Review of Reviews.*

Dr. Friedrich Bergius is a very acute chemist, but judging by the interviews he handed out to the New York papers, he is a very dull Nazi propagandist.

It's a wonder that the inflationists in their wild efforts to help the farmer haven't thought of changing the peck contents of a bushel. Surely two pecks of corn for the price of four would go a long ways towards restoring the parity of farm income.

Last summer a survey of the l/c/l sales of alkali from the Metropolitan district revealed 179 local distributors in this territory, and it's our safe guess that the number of distributors is today rather greater than less, despite many heart-to-heart talks, lunches, golf tournaments and/or bowling matches.

If you are sufficiently famous to receive in the mail a "Chemical Who's Who" questionnaire, you will have a first class opportunity to demonstrate efficiency by writing legibly and returning promptly.

At Pittsburgh, the A.C.S. Division of Chemical Education is holding a symposium on "What Industry Wants of Its Chemists," which is our idea of a highly debatable subject that needs a lot of sympathetic thought both among the industrialists and the teachers. As Chemical Industries has said editorially: "Here is indeed a first class problem in adult education, for if our teachers of chemistry regard the chemical manufacturer with apathy or suspicion or disdain, there can be no rapprochement between industry and science, and in this pragmatic epoch of chemistry they are certainly rendering themselves, their students, and their profession a very bad service."

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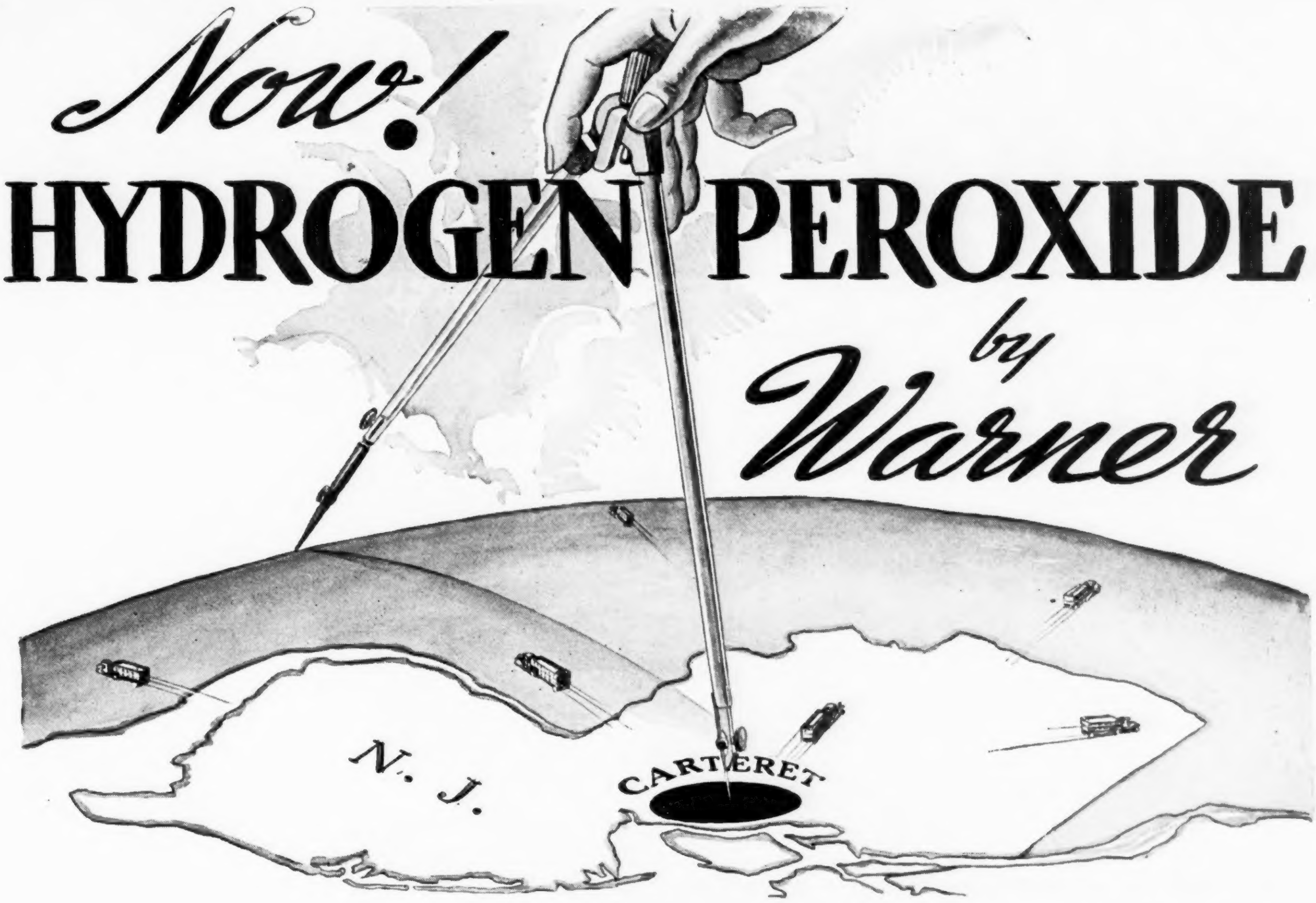

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Every step in the production of Warner Hydrogen Peroxide for all industrial and technical uses is under constant Warner control. From the ownership of the raw material sources to the delivery of the finished product, Warner carefully guards the purity, stability and uniformity at all times.

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